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TRANSACTIONS OF THE

SECTION ON

Obstetrics *and* Diseases of Women

of the
American Medical Association
at the Sixtieth Annual Session, held at Atlantic City, N. J., June 8 to 11, 1909

AMERICAN MEDICAL ASSOCIATION PRESS
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MENTAL ALIENATION IN WOMEN AND ABDOMINO-PELVIC DISEASE

CHAIRMAN'S ADDRESS IN SECTION ON OBSTETRICS AND DISEASES OF WOMEN AT THE SIXTIETH ANNUAL SESSION OF THE AMERICAN MEDICAL ASSOCIATION, 1909

W. P. MANTON, M.D.
DETROIT

At the opening of this Section for 1909 I desire to express to you my sincere appreciation of the honor which you have done me in continued confidence during the past years. It comes to few men to have served continuously a section in every capacity within that Section's gift, and now in relinquishing active office after so long a period, I feel that my being here is due rather to your kindly tolerance than to anything that I may have done to merit it.

This Section, from the small and inconspicuous gathering which annually took place before the reorganization of the Association, has now become a factor in the world's work, and its transactions present a volume on special subjects in scientific value second to none. The papers and discussions emanating from this Section have greatly enriched the literature of gynecology and obstetrics, and it only remains for us to maintain the high standard which has been reached in our deliberations.

At the turn in the lane we sometimes pause to look back along the way that we have come, observe the windings of the path, the roughness of the ground and the hard places that have been crossed, and, perhaps, with Stevenson, we "draw back and shade our eyes be-

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fore the picture dawns on us in full breadth and outline."

After more than a quarter century of active interest in the nervous and mental disorders of women associated with pelvic disease, I may, perhaps, be permitted at this time again to refer briefly to a subject regarding which I have spoken much, and review some of the things historical and some which have passed under observation during the period mentioned, and for which I may claim, at least in some degree, responsibility.

In his book on "Mind and Body" Alexander Bain states that "the entire bodily system, though in varying degree, is in intimate alliance with mental function. To confine our study to the nervous substance would be to misrepresent the connection, and the knowledge of that substance, however complete, would not suffice for the solution of the problem." But this idea was almost as old as the hills when Bain wrote the words quoted, and was familiar centuries before the Christian era, for Hippocrates and his followers understood the so-called "sympathetic insanities," while at a nearer time the man out of the tombs exemplified, if he did not put into words, a fact now familiar to all, the relation of somatic conditions to the delusion of the insane.

Acting on the material facts which medicine had separated from the dim uncertainties of philosophy and metaphysics, the ancients appear to have cared for and respected their mentally deranged with a greater solicitude and consideration than was accorded the insane by subsequent generations, for during the Middle Ages, dark ages indeed for the unfortunates who bore the blotted brain, the subject of mental disorder was looked on as a sore on the fair face of humanity and a shame and disgrace to both family and state. Cruelty and brutality obtained to extreme degree, and the mentally sick, like Shimshon of old, was often the butt of the jester and forced to make sport for his hardened keepers and a degraded populace.

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Such was the status of the insane up to the latter part of the eighteenth century, when Pinel, most courageous and enlightened of his time, struck off the fetters from the inmates of Bicêtre (1792) and inaugurated a new era in the treatment of mental disorders. From this time on, increasing interest in the welfare of the insane developed, the study of psychiatry received an impetus and a knowledge of forms and the classification of mental diseases became more exact and thorough.

From the present-time point of view, it seems strange that, with all the philanthropic efforts directed toward the insane and the renewed interest created in the study of the morphology of mental diseases, the influence of somatic conditions should have been so almost completely ignored. The psychiatrist of that day seemed to have forgotten that, as Cowles remarks, "In the study of mental diseases it is important to find their true place in relation to other pathologic conditions," and that "as a physician he must treat the whole body," for "psychiatry belongs to general medicine, and mental disease, like bodily disease, is not an entity nor an agency, but the result of normal function acting under abnormal conditions," etc.

It was not, however, until the diseases of women had been separated from medicine as a specialty that interest in their possible relationship to insanity began to be manifested. And it must here be remarked that the inception of this interest did not arise with the alienist who, busied with his large material, was seeking for the cause and origin of mental disorder, but with the gynecologist who noted the effect on the nervous system and mind of puberty, the menopause, and childbirth in certain individuals and observed the mental breakdowns resulting from ill-conducted lives, to which was added the continued irritation of abdomino-pelvic disease. He it was who drew attention to the possibilities of cause and effect in this class of cases.

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In 1854, fired by an enthusiasm begot of experience with pelvic disease in the sane, Dr. Horatio B. Storer sought to carry his investigations forward in instances of unbalanced mind, and in a resolution offered before the American Medical Association, effected the appointment of a special committee to look into the relationship between insanity and the disorders peculiar to women. Unfortunately for all concerned, this proposal met with cold reception from those whom it would be supposed would be mostly directly interested; asylum superintendents became at once jealous of their so-called rights and the invasion of the gynecologist into the realm of psychiatry and refused to cooperate, so that, after an existence of several years, the committee was finally discharged, having accomplished nothing. A number of years then elapsed before a second attempt was made to study this important subject.

Somewhere about 1878, at the request of the superintendent, Dr. A. J. C. Skene undertook some gynecologic work in the Kings County Asylum at Flatbush, N. Y. The work accomplished was of the highest order, and it is to be regretted that it could not have been longer continued until more definite results had accrued from the observations made and our knowledge along this line thus augmented.

More than twenty years ago, when I began my work at the Eastern Michigan Asylum, no systematic efforts were being made to ameliorate the condition of female patients in our institutions for the insane suffering from abdomino-pelvic disease, or to place on a sound basis the knowledge of the influence which such disorders might exert on the causation and progress of mental troubles. Advancement in general medicine had by this time paved the way to a more enlightened order of things so that, although there was still opposition and criticism, the path was made easier and the way was more direct.

To-day, as the result of these tentative beginnings, there is hardly an asylum of size in this country where

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either a consulting gynecologist or a member of the staff, set apart for this duty, may not be found.

And there is one particular reason for this, a reason which I have persistently urged, and to which both laity and the profession have now become alive. If the state obligates itself to the care of the insane in the way of feeding, clothing, protecting and housing, it can not do these things and refuse its unfortunate charges relief from physical suffering; it is morally bound to care for bodily ailments while seeking the alleviation of mental distress.

But the question may be asked: If amelioration of bodily suffering has become a part of the asylum's function, what has been achieved thereby as regards the mental condition of the patient, and what are the end-results in the matter of mental cure? The answer may be found in the reports of asylums where this work is most actively carried on, and in the literature of insanity relating to this subject.

Summarized, we may recount a few of the conspicuous results that have obtained during the past two decades. We have added to our knowledge regarding the relationship existing between mind and body; we know more at present than was formerly known, that, while mind may exert a remarkable influence over the functions of the various internal organs, the converse is also true, morbid state of any viscus often aggravating the existing mental malady, or even lead to the ultimate downfall of the greatest intellect. Head, in his Goulstonian Lectures for 1901, has shown that physical pain from visceral disease is productive of decided psychic manifestations, and I and others have demonstrated that relief from suffering brings about a mental palliation often otherwise unattainable.

The frequency with which abdomino-pelvic disorders exist in insane women has been determined and has led to a more careful and systematic examination of the female patients in our institutions for those conditions

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which the mental malady may overshadow in its manifestations. My own investigations have shown that about 81 per cent. of insane women suffer from some form of pelvic or abdominal disorder, and these statistics do not differ materially from those of most other observers, Hobbs and Isabella Davenport alone reporting so large a percentage as 93.

The frequency with which postoperative insanity of a more or less permanent form is likely to occur following surgical intervention in, particularly, diseased abdominal and pelvic viscera, and the relationship and frequency of abnormal mentation to pregnancy, eclampsia and the puerperium has been shown. Postoperative insanity is of rare occurrence and satisfactory statistics can be obtained only from asylum records. From a careful investigation Dewey concludes that the ratio of cases of mental alienation from this cause going to public institutions is less than 1 per 1,000, and my own observations quite accord with this. Such statistics, however, are misleading and do not represent the actual number of cases of insanity resulting from surgical operations, since many instances are undoubtedly of an ephemeral nature, lasting but a few days or weeks, and, being cared for at home or in a general hospital, are not made public. Bearing on this point, the investigations of Sears published some years ago are of interest. The preponderance of mental disorders following operations appears to lie with women, since mental breakdown is more likely to result from operations on the pelvic organs than on other parts of the body, the eye alone excepted. Excluding the surgery of the sexual organs, women do not appear to be more liable to insanity than do men. Dewey and others direct attention to the fact that the mental condition of the patient prior to operation is not sufficiently taken into consideration, and that in many instances insanity is either actually present or the patient it at the border line before the surgical procedure is undertaken. As regards insanity following eclampsia,

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my investigations published in 1895 indicate that, for this country at least, it is probably such an infrequent sequel that eclampsia hardly deserves consideration as an etiologic factor. Of 1,271 insane patients, the puerperal condition, aside from eclampsia, was ascribed as the existing cause of the mental disorder in 108 instances. According to Kraepelin, childbed is responsible for the insanity of 6.8 per cent. of all women admitted to our institutions, while Peterson says that in about 10 per cent. of insane women the mental disturbance has its origin at the epoch of reproduction. In this connection Hobbs has pointed out that in the majority of these mental states septic infection, immediate or remote, is the responsible agent.

It has been more clearly shown that the hallucinations and delusions of the insane are not always the figment of a disordered brain but are frequently dependent on intra-abdominal or pelvic lesions. In 1896 I pointed out, in a series of illustrative cases, that these mental phenomena are often the expression of somatic peripheral irritation. Hallucinations from such causes may even develop in the sane, as witness a case reported by White, in which the removal of two apparently healthy tonsils relieved the patient of a fancied foul breath. This was undetectable by others, but, in spite of absolutely healthy organs and a normal mentality, was the cause of much mental distress to the patient. Head found that hallucinations of vision, hearing and smell may appear in phthisis, heart disease and aortic aneurism. My observations go to show that delusions may develop from external or visible bodily conditions, from easily detected visceral disorders, and from obscure abdominal and pelvic states. The delusions of micromania may often have foundation in some such perversion of abdominal sensory impression, the erroneous judgment excited by visceral adhesion, a tumor or ovarian irritation, and may give rise to the impression that the intestines have been removed or are absolutely closed

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up, as in a case cited by Frederick Peterson. "It is further demonstrated," says Stoddart, "that all these mental symptoms arise in association with severe prolonged pain resulting from disease of the viscera referred to the body wall," and again, "they do not occur in the absence of pain." Further investigation may show that still more of these manifestations are really based on physical causes.

Finally, as to the end-results and the curability of insanity through operative measures: It has always been a popular notion, fostered no doubt by indiscreet and thoughtless observations on the part of the profession, that insanity in women is most frequently the direct result of a diseased condition or perverted function of the organs of generation, and hence, it has been believed, that the restoration of these parts to a normal state, either by repair of defects or the removal of pathologic structures, would lead to renewed mental health. To those who have had the largest opportunity to study these questions, however, experience has shown that this is not altogether true. While, as has been pointed out, abdominal and pelvic disease is found to be present in a large percentage of insane women, it is possible that the proportion is no larger than obtains among the sane The latter, however, may be for years the subjects of great suffering, discomfort or distress without the local disorder producing the slightest effect on the action of the mental machinery. It is too generally forgotten by those who make extraordinary claims as to the curability of insanity through the removal of the particular local flaw, that in the insane the mental malady has, in the majority of instances, an unstable nervous organization as its substructure. It has been put down that the proportion is about 1 to 300, this varying with races and countries (Peterson). In the mentally diseased the frequency rôle of heredity, including "hereditary equivalents," is variously estimated at from 30 to 90 per cent.,

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and even in the functional psychoses it may amount to as high as 70 per cent. (Krauss).

If we also take cognizance of the disastrous effects of alcoholism, syphilis, tuberculosis and the strenuosities of modern life, we have an alarming array of etiologic influences constantly threatening mental integrity. In the unstable individual slight causes may, perhaps, be quite sufficient to overcome the mental equilibrium, but in those with a clean record something more than the abdominal or pelvic disease must account for the psychic overthrow. After persistent and patient investigation of cases in private, hospital and asylum practice, and the study of the reports of others, I am still unconvinced that local disorders, exclusive of septic or toxic conditions, ever result *per se* in mental dethronement. Given an ordinarily strong and healthy woman and subject her to unusual and prolonged mental strain, anxiety and loss of sleep, together with bodily over-fatigue and stress, or to excesses which undermine the general health and constitution, and a dormant defect, which previously produced no symptoms, may make itself manifest and mental breakdown result from the combination of processes. Hence the uterine, ovarian or other disease, through its newly acquired power of pain and its influence on the nutrition and functions of the body, becomes an important factor in producing mental depression, which, in turn, may ultimately lead to insanity. Of itself the pelvic or other morbidity is but a phase and would have no effect had not the preceding physical and psychic conditions rendered the patient incapable of resisting its action. Such cases are particularly amenable to relief and cure through proper moral and physical treatment, supplemented by the surgical removal or correction of the local lesion. This also applies to many instances of puerperal insanity the result of infection, inflammation or physical prostration from undue demands made upon the organism unequal to the strain.

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Again: "It is not unusual to find," says Mabon, "that insane patients, while convalescing from surgical operations, at times give evidence of mental improvement, going on, in some instances, to complete recovery, and this in instances in which the latter could hardly be expected. Sometimes this outcome may be due to the shock of the operation; in other cases the mental effect which the operation itself produces in the subject is to be credited with the mental improvement—the explanation being that we substitute a healthy for an unhealthy mental introspection; while in still others the increased personal attention received after the operation, together with the changed environment, forms the medium through which mental improvement results."

But though we are sure of a small percentage of mental cures following surgical operations on the insane, I still continue to maintain that we have no right, either as surgeons or humanitarians, to place the positive relief from physical suffering alongside the uncertain relief of the mental malady, but that whatever may be the outcome as regards the psychic disorder, relief and cure of somatic suffering is imperative, and this should be our constant thought and purpose.

But whether a cure of the insanity is effected or not, it is certain that improvement in the metal condition is likely to supervene from the removal of the focus of irritation; the subject is rendered more comfortable and therefore becomes more tractable, and through this is often changed from an untidy, refractory patient to a clean, industrious and orderly individual.

In the foregoing remarks I have attempted to touch on some of the conspicuous results that have followed from the investigation of insanity in its relation to the abdomino-pelvic disorders in women during the past twenty years. In the discussion I have credited the alienist's present point of view rather than that of the gynecologist, lest I be accused of bias; and whatever has been quoted has been set down largely in the psy-

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chiatrist's own words. If the gynecologist was once thought to be unwisely urgent and filled with over-zeal, the results of his good and persistent endeavors have won their reward and are today reflected in the changed attitude of students of mental disease. And surely such a showing can not be disregarded or attributed to over-enthusiasm on the part of those engaged in the work, for it can hardly be asserted that the alienist and the surgeon, together striving toward one end in harmonious effort, can both be deceived in so carefully wrought out and important a matter.

THE AUTHOR'S CONTRIBUTIONS TO THE SUBJECT OF INSANITY, ETC., AND PELVIC DISEASES IN WOMEN

A Contribution to the History of Ovariotomy on the Insane. Trans. Am. Assn. of Obstetricians and Gynecologists, 1889.

Sudden Emptying of the Bladder as a Cause of Cystorrhagia. American Lancet, 1890.

Puerperal Hysteria (Insanity). The Jour. A. M. A., July 16, 1892.

Experiences in Abdominal Surgery on the Insane. Am. Jour. Obstetrics, 1892, No. 5.

A plea for the Amelioration of Insane Women Suffering from Local Disorders. Am. Gynecological Jour., January, 1893.

A Contribution to the Surgical Pathology of the Gall Bladder and Ducts. Am. Gynecological Jour., June, 1893.

The Legal Question in Operations on the Insane. Trans. Am. Assn. Obstetricians and Gynecologists, 1893.

What Results May be Expected from Celiotomy in Insanity, Hystero-Epilepsy and Kindred Neuroses. Phys. and Surg., May, 1894.

Gynecology Among the Insane from the Gynecologist's Point of View. Medical News, July 7, 1894.

So-called Puerperal Eclampsia in Its Relation to Insanity. Am. Jour. of Obst., 1895, No. 6.

The Relation of Visceral Disorders to the Delusions of the Insane. Am. Jour. of Obst., 1896, No. 6.

Postoperative Insanity, Especially in Women. Ann. of Gyn. and Ped., September, 1897.

Simple Melancholia and Genesic Disorders. Phys. and Surg., December, 1897.

The Frequency of Pelvic Disorders in Insane Women. Am. Jour. of Obst., 1899, No 1.

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Operative Gynecology on the Insane. Medical News, March 11, 1899.

Pelvic Disease in Women and Insanity. Trans. Michigan State Med. Soc., 1899.

Episodes in Gynecological Practice Among the Insane. Trans. Am. Medico-Psychological Assn., 1901.

Some Lessons Learned During Twelve Years Experience in Abdomino-Pelvic Surgery Among Insane Women. Trans. Am. Gynecological Society, 1901.

Note on the Ocurrence of Gallstones in Insane Women. Trans. Am. Gynecological Soc., 1903.

The Physical and Mental Effects of Gynecological Operations. Detroit Med. Jour., August, 1907.

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THE CHOICE OF OPERATIONS FOR RETRODISPLACEMENTS OF THE UTERUS

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In presenting this subject for consideration, I am not unmindful of the fact that much has been written and said on it, and that many of the members of this Section have worked out operations of their own to correct a retrodisplacement of the uterus. Where there is such a diversity of opinion, one must conclude that no one operation gives universal satisfaction and that the factors entering into the cause of retrodisplacements are not generally understood.

It is with the hope of bringing out a thorough discussion of this subject that I present this paper. This question will be settled aright in time as other surgical questions have been in the past, and the proper operations selected.

In the first place we must acknowledge—although many physicians of Europe and America dispute these points—that a woman who has a simple retrodisplacement of the uterus may suffer because of the displacement, and that a retrodisplacement predisposes the patient to disease of the uterus or adnexa. When a displacement is associated with disease of the tubes or ovaries nearly all agree that something should be done to rectify the trouble.

POSITION OF THE UTERUS

The uterus is partly suspended and partly held in position by ligaments. Why its normal position is maintained is not universally understood.

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The uterus that causes no discomfort to the patient is usually anteverted, slightly flexed, and placed at right angles to the vagina. The fundus is supported by a soft cushion, the bladder, and held forward by the restraining round ligaments and their peritoneal coverings, also by the uterosacral ligaments, which prevent prolapse. The broad ligaments prevent permanent lateral displacements. The intra-abdominal pressure and intestines assist in holding the fundus forward and the counter-pressure of the perineal body makes the normal position possible.

The position varies with the condition of the bladder and rectum. The organ is freely movable and its position can be temporarily changed by manipulation. It moves with each respiratory act. With the broad ligaments it divides the pelvis into two unequal portions, viz., a shallow anterior part containing the bladder and a deep posterior portion containing coils of intestines.

CAUSES OF RETRODISPLACEMENTS

In the normal state all the supports of the uterus act in harmony during local or general muscular exercise. In diseases this synchronous action is disturbed. In many individuals a retrodisplacement is coincident with a general disturbance of the equilibrium of the abdominal and pelvic organs, and under such circumstances it increases the possibility of a visceroptosis. A general visceroptosis, on the other hand, aggravates the displacement.

The factors which disturb the harmonious action and arrangement of the uterine supports may be enumerated as follows:

1. A laceration of the cervix or disease resulting therefrom.
2. An endometritis or metritis.
3. Increased weight of the uterus.
4. Cervical constriction, resulting in congestion.
5. Tumors of the uterus.
6. Senile or small uterus.
7. Diseased tubes.

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8. Diseased ovaries.
9. Congenital weakness of supports.
10. Lacerated perineum.
11. Inflammatory diseases of the pelvic organs or peritoneum.
12. Increased intra-abdominal tension.
13. Relaxed abdominal muscles.
14. Prolapsed intestines or other viscera.
15. Constriction at the waist-line.
16. Constipation and straining.
17. Jars or traumatism, weakening the supports or disturbing the equilibrium.
18. Temporary and habitual partial displacements from bladder, overdistention, etc.
19. Overdistention of rectum and pressure upon the temporarily displaced fundus.
20. Adhesions pulling the uterus out of place.
21. Improper exercise, poor food and lack of hygienic surroundings.

When a uterus becomes temporarily retrodisplaced—and this condition occurs at short intervals—the supports weaken. The forces which in the normal state help to hold the uterus forward, viz., the intra-abdominal tension and pressure of the intestines, now are factors in perpetuating the displacement. The ligaments stretch more and the fundus is pushed into the deep posterior pit and a pronounced retroversion and flexion often occurs.

Could we but recognize the incipient stages of this progressing condition and know every factor entering into the trouble, much could be done to avoid a permanent displacement.

SYMPTOMS

Occasionally unmarried women especially do not know to what their symptoms are due until a physician makes a diagnosis of a retrodisplacement.

It is frequently the case that the displacement alone is not the cause of the trouble, but the associated disease of the tubes or ovaries. Many young women have retrodisplacements and develop disease of the tubes or ovaries later because of this displacement.

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The symptoms are dependent on the degree of retrodisplacement, the character of the infection, if any, and the associated conditions, also the age and social status of the patient.

That simple retrodisplacements do cause trouble I am quite certain, or at least I will state that in many instances in which the retrodisplacement alone has been corrected the symptoms have disappeared. Symptoms are modified by any condition which may disturb the harmonious relationship of the organs or assist in producing the retrodisplacement, as enumerated above.

In a retrodisplacement some of the special complaints which women make are:

1. Backache.
2. Bearing-down pains.
3. Tenderness of uterus.
4. Constipation.
5. Dysuria.
6. Dysmenorrhea.
7. Menorrhagia.
8. Metrorrhagia.
9. Neurasthenia.
10. Sterility.
11. Leucorrhea.

If cases of anteflexion do cause trouble at times, why should not a retrodisplacement in which there is the possibility of the uterus falling so much lower in comparison? The uterus being below the normal circulatory level, the venous return flow is impeded. Congestion, endometritis and metritis follow as natural consequences.

In any disease of the ovaries, tubes, or in appendicitis with peritonitis a retrodisplaced uterus greatly augments the suffering. The fundus and adnexa become congested and are crowded as a mass into the bottom or apex of the pit, pressing on and adhering to one another. A loop of the intestines is often intimately associated with this mass. The destruction of tissue is then greater and functions of the organs are much interfered with.

Many an old woman will give a history of displacement of the uterus from which she had suffered from girlhood. It had troubled her at menstruation, at defe-

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cation and at micturition, the peace of mind and body being so disturbed as to make life unbearable, and the condition ended in greater disturbances of bladder and bowel, with complete uterine prolapse. It had been the bane of the woman's life and did not even disappear at the "change of life," as often predicted, but followed her during her declining years. Countless office treatments have been given and numerous instruments of torture have been employed to overcome troublesome retrodisplacements, with little benefit, and often much harm, so there is a crying need for a sure and certain cure by a safe and sane method.

OPERATIVE TREATMENT OF RETRODISPLACEMENTS

In considering the surgical treatment for retrodisplacements it is necessary to understand all the factors entering into the maintenance of the normal position, and also to recognize what one or more conditions present may have a causative relation to the misplaced organ.

The success of an operation for the replacement of the uterus will depend largely on the interpretation of these factors and the attention given them by the individual operator. No operation will prove its real worth or give the desired relief should a general relaxed condition of the abdominal muscles with visceroptosis or a lacerated perineum go unheeded, or if any other pelvic or abdominal lesion exerting any influence on the position of the uterus remain untreated.

All sorts of operations have been performed in the past for the cure of retrodisplacements, many without regard for the future comforts of the patient or for the proper functions of the pelvic organs. The greater proportion of them looked all right at the time of the operation, but statistics and facts have shown that many have been failures. A few have stood the test of time, but only when properly selected and employed, with due reference to all other associated conditions.

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The operation of ventrofixation and suspension, as introduced in the United States by Howard Kelly, was once quite popular and is to-day performed by a number of operators. It is true of this operation, as well as of any other, that when performed improperly and by incompetent men bad results are often to be expected. This operation has given a great many women comfort and ease. On the other hand, it has resulted in much harm and unnecessary suffering for others.

When properly performed on women past the menopause in whom there is a call for a rapid operation and for the suspension of the organ for retrodisplacement and prolapse, the results will be quite satisfactory. Also, in women who have the tubes or ovaries removed, and if a septic condition exists, at the time, there is less danger of complications in simply stitching the uterus to the peritoneum. Other excuses for its employment might exist in small, round ligaments, or in cases in which the uterus is to be held forward temporarily after an operation for appendicitis, fibroid, salpingectomy, or cysts of ovaries.

I myself have seldom selected this operation, because of the fact that there are more desirable methods of holding the uterus up. By this procedure the uterus is held in a fixed unnatural position and by an unnatural ligament. It seems like a makeshift operation. It is at variance with the principles governing the normal position of the uterus. It causes disturbances during pregnancy and makes labor difficult at times. It favors adhesions of the bowels and invites obstruction by the central ligamentous band.

Alexander's operation is not a very popular one today because of the fact that failures have been numerous and the operation has been improperly applied or performed. The round ligaments, especially the proximal half, are sufficiently strong to act as good supports when there is not a constant strain placed on them.

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Any operation which manufactures or secures good supports for the uterus will not be ultimately successful if there is a constant strain on these supports. Failure will result as the tissues will stretch; therefore it is necessary to bring about the normal relationship of the uterus and surrounding parts, utilizing all the normal supports for the purpose and distributing the intra-abdominal pressure in a way to favor the maintenance of that normal position, at the same time correcting any associated disease acting as a causative factor. At one time this operation promised to be the panacea for women with retrodisplacements. There is no question as regards its efficacy in certain cases and it is a scientific and logical operation to perform in cases in which no disease exists within the abdomen or pelvis that requires a laparotomy.

In the past the enthusiastic advocates of this operation employed it in all cases, even going so far as to open up back of the uterus to separate adhesions due to diseased tubes and ovaries, packing the space and shortening the round ligaments extraperitoneally. The absolute failure to relieve the symptoms in all such cases and in many others caused the operation to fall into disuse. I have in a number of instances enlarged the opening to remove a diseased appendix or to resect a tube or ovary where no adhesions existed with good results. I believe it is best to draw the peritoneum up through the opening and close off the sac from the peritoneal cavity, as it makes a better support to include the peritoneum, especially the anterior fold.

The Webster operation finds a great many advocates. I have employed it in selected cases. It has the same objections as any other operation which does not permit the use of the strongest portion of the ligamentous tissue. It also produces a considerable constriction of the body of the uterus by the back-folding, clamping method of the ligaments. I am not sure but that much interference with pregnancy will be found to fol-

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low this operation in the future. It also introduces an extra suture line for possible complications. It is of advantage where a sustaining force is required for the ovaries and tubes, and, especially in cases where a raw surface posterior to the uterus exists, it protects this surface from possible adhesions.

Dr Coffey[1] of Portland, Ore., in a well illustrated article published October, 1908, describes an operation of his own for retrodisplacements. It consists in folding the round ligaments downward in front of and latteral to the fundus and refolding them up to the horn of the uterus, making a tuck in the broad ligament over these folds. He claims perfect results. It is a rational operation in certain cases.

The additional time consumed in the operation and the fact that the weakest portion of the round ligaments remain as the supports, the largest and strongest portions being used up, the additional amount of traumatism and suture line left within the tissues and abdomen, would naturally favor adhesions between these areas and the bowel. In septic cases there may be an additional risk of infection and general adhesions. Theoretically it would interfere with the natural enlargement of the uterus during pregnancy also, as there remain two folds of the ligament and one of the peritoneum to prevent the natural enlargement; pain or miscarriages might possibly result.

There are certain well-defined cases of lengthening of the uterosacral ligaments, as when there is some prolapse of the uterus, in which a shortening of these structures favors a more speedy return to health and lessens the possibility of prolapse.

The ligaments can be shortened from above or below; I believe best from above, as we can explore the abdomen and pelvic contents at the same time.

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1. Coffey, R. C.: Principles on Which the Success of Surgical Treatment of Retrodisplacements of the Uterus Depends, Surg. Gynec. and Obst., October, 1908.

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These ligaments should be shortened in certain cases where any other operation is performed for a retrodisplacement to insure good results if they are weak.

Any operation which folds the round ligaments on themselves within the pelvis, as in the Mann operation, does not offer the same support for the uterus, as it may be very heavy and partly deformed, flexed or bent on itself. Relapses may be frequent; the weak end of the ligaments are not strengthened; in fact, the additional constant restrain put on them by shortening may weaken the external thin ends.

I would offer the additional criticism on the Mann operation that there is, as in similar operations, the exposure of a suture line within the abdomen which may provoke adhesions. The same objections could be offered to the Goffe operation.

The operation of fixing the round ligaments and covering to the parietal peritoneum near the internal abdominal ring is a much more successful operation than many, as it allows a broad approximation and, if the loose distal portion of the ligament is tacked up to the abdominal wall there is an elevation of the pelvic peritoneum as well. It is not employed as often as it should be. I have been pleased with it in special cases. I believe it is far superior to the operations which leave the weak external end for support or in which an extra and unnatural ligament is created. The operation can be done through the median incision and quickly, but furnishes a chance for adhesions along the suture line. The operation of vaginal fixation as employed by Müller has not appealed to me, as it makes too radical a change in the position of the uterus and in young individuals would certainly not be indicated.

Ferguson was one of the first operators (1899) to recognize the importance of correcting the disease of the adnexa and explore the abdomen for other lesions before correcting the retrodisplacement of the uterus. His operation was a step in the right direction, but has

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been replaced by the Gilliam operation or its modifications to-day. The typical Gilliam operation as first planned by its originator made too direct a pull on the uterus and left an unguarded depression between the normal and artificial exit of the ligaments inviting intestinal obstruction.

The modification which I have at last worked out consists in a dissection of the skin back to a point opposite the internal abdominal ring, passing a curved for-

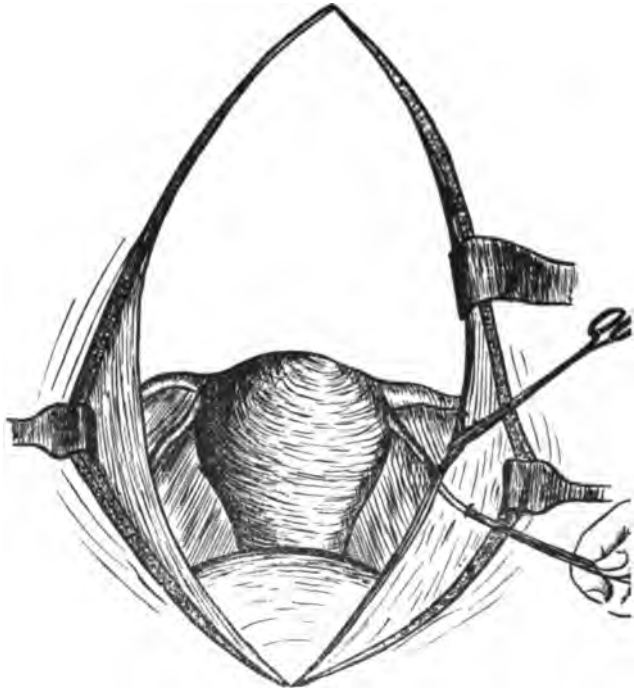

Fig. 1.—First step of modified Gilliam operation; forceps dragging round ligament through fascia opposite internal abdominal ring.

ceps through the fascia at this point between the folds of the broad ligament to within an inch and a half of the horn of the uterus, catching the ligament, which, together with the peritoneal covering, is brought out on the abdominal wall (Fig. 1), spread on the fascia in fan shape and anchored by three or four interrupted chromic catgut sutures (Fig. 2).

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The anterior fold of the peritoneum can be pulled out to any extent, making any tension desired. In young women I am in the habit of making a transverse curved skin incision at the border of the pubic hair line and a longitudinal incision through the underlying tissue.

I am always careful to observe the condition of all the organs within the abdomen and pelvis and to cor-

Fig. 2.—Second step of modified Gilliam operation; sutures being placed and ligaments fastened fan-shaped on opposite sides to fascia of external oblique.

rect any abnormal condition possible at the time. A lacerated cervix, or perineum or cystocele must necessarily be overcome if present, usually after the abdominal work.

The after-care of these cases is important. The general visceroptosis may be corrected by a proper long straight-front corset; the intra-abdominal tension by

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correcting the diet and regulating the bowels, treating a menorrhagia or metrorrhagia by rest and medication; and the inflamed or congested cervix by hot and astringent douches.

When all the associated or interdependent diseases and symptoms are thus carefully managed the results are all that could be desired.

CONCLUSIONS

1. Retrodisplacements of the uterus often cause much discomfort.

2. The anatomic arrangement of the pelvic tissue invites a retrodisplacement which causes more discomfort than other forms of displacement.

3. The round ligaments and their coverings act as restraining bands, lessening the possibility of permanent retrodisplacement.

4. The harmonious action of all the supports is essential to the uterus for its normal position.

5. When the round ligaments become elongated by frequent repeated retrodisplacements the intra-abdominal force is misapplied and the displacement becomes permanent.

6. The operation which interferes with the laws governing the normally placed uterus is not to be advocated.

7. The operation which produces unnecessary intra-abdominal traumatism should not be chosen in the ordinary case.

8. Operations which could possibly interfere with the enlargement of the uterus during labor should be used in selected cases only.

9. Operations which leave an additional suture line within the abdomen may cause subsequent trouble.

10. Operations which do not give as strong a support as possible consistent with the normal functions of the uterus may result in failure in some cases.

11. The operation which utilizes the normal ligaments with little or no traumatism is less troublesome and more scientific.

The advantages of the modified Gilliam operation as I perform it are the following:

1. It employs only normal tissue for support.

2. The direction of the pull for that support is in a natural line.

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3. It eliminates the weak portion of the ligaments in Nature's plan for the normal position.

4. It does not interfere with normal pregnancy or the uterine functions.

5. No additional suture line is present within the abdomen.

6. No traumatism to the pelvic tissue is produced and consequently adhesions do not follow.

7. It puts the uterus at right angles to the vagina and it elevates and tightens the broad ligaments and lifts up the ovaries.

8. It does not interfere with bowel or bladder functions.

9. It takes the strain off the uterosacral ligaments and favors their return to normal tone.

10. The ligaments are tightened sufficiently to prevent the temporary retrodisplacement; consequently the intra-abdominal pressure is properly distributed.

11. It allows the operator to investigate thoroughly the pelvic and abdominal organs.

12. When the harmonious action of all the uterine supports is restored this operation gives positive and permanent results.

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ABSTRACT OF DISCUSSION

Dr. C. W. Barrett, Chicago: The question of treatment of retrouterine displacement resolves itself, not so much into the treatment of retrodisplacement as into the treatment of retrodisplacement of the uterus and its complications. In 1881, Dr. Alexander gave us the operation of shortening the round ligament, laying great stress on the external shortening of the ligament. A few years later, Olshausen, Kelly and others gave us the abdominal operation, dealing with the pathology and doing ventrosuspension. Ever since that time we have been trying to devise an operation that would give the advantages of the one without the disadvantages of the other, and it is only within the last few years that we have had an operation that practically covers that question. In any operation for retrodisplacement there are certain definite points of advantage which the operation should give us, and it is better to deal with principles when we may rather than with technic. The advantages which any operation must have at the present are: First, safety. We are dealing with a condition that does not cause death, and the operation must be safe. Second, simplicity. The operation must be simple because we must combine it with much other operating. Third, it must allow inspection of conditions within the abdomen. Alexander

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laid great stress on the fact that his operation was an external one; but for an operation to stand the test of time there must be an opportunity for the most careful inspection and correction of conditions in the abdomen, and the best part of the normal ligaments must be employed to hold the uterus forward. We must also deal with the ligament in a way that will leave it correctly placed, not running transperitoneally, but leaving the abdomen at the proper place, the internal ring, if that is possible. All these operations which have these advantages will stand what Goldspohn calls the double test of pregnancy; that is, they will allow pregnancy to progress to delivery without interfering with the success of the operation.

Those operations dealing with the best part of round ligaments may be divided into two classes: Those which get the ligament within the abdomen where it is easy to find, where it does not take up time, and those which find the ligament outside the abdomen. The latter necessitate a tedious dissection, and it is always doubtful about finding the ligament. After six years' experience with what I call the intramural transplantation of the round ligaments—that is, getting the ligament within the abdomen, taking it out through the internal ring—I have found that it stands the double test of pregnancy, that it does not interfere in any way with the pregnancy and that the pregnancy does not interfere with the holding of the uterus. It has been performed in women who were pregnant, and in whom it was necessary to open the abdomen for an incarceration of the pregnant uterus. Such an operation carries the ligaments out of the abdomen at the right place, the internal ring, and uses the strongest part of the ligament for holding the uterus and makes an anatomically and physiologically perfect operation for holding the uterus forward and allows the surgeon to do anything else necessary within the abdomen at the same time.

Dr. J. Wesley Bovée, Washington: Dr. Barrett has given us the proper principles to be followed in the treatment of these displacements, but he has given one operation for all. I hold, and I am not alone in this contention, that there is no one operation that is applicable in all cases. The principles of the proper supports of the uterus have not been satisfactorily worked out to many of us, and certainly the operations for the relief of deformities or defects in these supports have not been satisfactory. Whatever is needed to be done will depend on the condition that is present. I think shortening the round ligament in many instances will be sufficient. But there are so many other conditions that have to be considered; for instance, the defective attachment of the ligaments to the lower pole of the uterus which hold the cervix near to the outlet of the vagina, accompanied with abnormally long uterosacral ligaments. When uterosacral ligaments are attached so high to the cervix that they do not have sufficient leverage to hold

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it in the hollow of the sacrum no operation on the round ligaments will be of any lasting benefit. In one case I did ventrofixation of the uterus. Eight months later this patient entered Dr. Fry's service in another hospital and Edebohls operated by raising the uterus, appendages and vagina by sutures. The uterus was still firmly attached to the abdominal wall and the cervix eight inches away from that was protruding through the vulva, showing that the fundus might be fastened to the abdominal wall and yet procidentia be present. We see so many cases of procidentia of the uterus in which none of these ligament operations will suffice. Then, again, attention is attracted to the necessity of support from below and looking out for defects in the anterior vaginal wall; so that this field, when details are considered, is an exceedingly large one. I do not think that in any paper or in any number of days of discussion we are very much closer to an absolute determination of what ought to be done, except to find out that no one thing does, and no two things will answer, and that any gynecologic surgeon who depends on one, two or three operations for the correction of retrodisplacement of the uterus will find out sooner or later that he will have to enlarge his list of procedures.

Dr. H. J. Boldt, New York City: I feel that Dr. Bovée has struck the keynote when he said that no one operation is a panacea for retrodisplacements. It must be remembered that the Alexander operation was devised for patients who had a retrodisplacement with the uterus freely movable and with no disease of the adnexa. It is not proposed to cure a patient with procidentia by shortening the ligaments, as devised by Alexander. When the uterus is freely movable and there is no adnexal disease, if the operation is properly done, invariably good results follow. But we must remember that, in that class of cases, the greater number of patients will get along without any operation, a mechanical support alone being sufficient. In that other and larger class of patients with complications, such as diseased adnexa or adhesions of the uterus to the pelvic floor, the method of procedure will differ with the individual experience of the operator. I believe that in women well past the childbearing period no operation will equal ventrofixation of the uterus. But it should never be done on any woman unless she is past the childbearing period. The Gilliam operation or the one suggested by Dr. Benjamin I believe will answer in women likely to bear children.

Dr. R. B. Hall, Cincinnati: I agree that there is no one operation that should be used exclusively for retrodisplacement of the uterus. I believe that many conditions exist in which the operation should be varied. It is exceedingly rare, even after the childbearing period, that ventrofixation of the uterus should be done at all. My objection to the operation is the great danger of intestinal incarceration and intestinal obstruc-

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tion. If we could gather all the cases of intestinal obstruction that have occurred after ventrofixation there would be a large number on record. I appreciate how one dislikes to report cases of intestinal obstruction coming on six months or a year or two years or longer after fixation of the uterus. I contend that with the many operations from which we may select, we owe it to our patients and to ourselves to choose a method which will not carry with it the possibility of intestinal obstruction.

Dr. H. O. Marcy, Boston: In my studies of inguinal hernia I find deformity in the construction of the inguinal canal in almost all the instances in which there is weakening of the lateral ligaments. As a consequence, it has been said as a basic principle that we should restore, so far as possible, everything to its normal pattern. The whole secret of cure of inguinal hernia is the normal reconstruction of the parts. Many factors must come into the problem, and it would be easy to write a small volume on this interesting subject. In restoring the weaker portion of the ligaments as referred to and fixing it beneath the peritoneum, we are at the same time reconstructing the weakened inguinal canal. In my later experience I open the abdomen and have everything under inspection. I followed Alexander's operation for a considerable period and was suprised to find failures where I looked for success. I was with Dr. Alexander and saw him operate and had him operate in my hospital. Then I did the other operation of intrafolding or fixing the round ligament to the abdominal wall. When the uterus is freely movable, other things being normal, reconstructing the inguinal canal and replacing properly within it the round ligaments solves in a very large measure this most serious problem.

Dr. Reuben Peterson, Ann Arbor: No one expects to convince anybody by this discussion. Every operating surgeon has his own way of dealing with retrodisplacement of the uterus and, no matter how much time we may devote to this subject here, every man will go home and to-morrow perform the operation he thinks best. We have heard a good deal about the Alexander operation, and of how it is not an operation for the retrodisplacement when the uterus is adherent. It seems to me, however, that Dr. Marcy has hit the nail on the head when he says that we should reconstruct the inguinal canal. The only way in which we can do that is to perform the Alexander operation as modified by Edebohls—opening the inguinal canal and shortening the ligament within the canal. Then, if we find a hernia, as we often do, it can be cured and the ligament shortened at the same time.

I have tried the various operations suggested for retrodisplacement of the uterus. My experience with ventrosuspension has been very bad. I have had to perform Cesarean section twice for dystocia developing after this operation, hence I

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never perform the operation in the childbearing woman. I have tried the Webster-Baldy operation. I found that while it is good for a certain purpose—elevation of the ovary—there are so many relapses that I have discarded it. Some years ago I adapted the Alexander method in all cases of retrodisplacement with or without adhesions when the uterus needed to be brought forward and held there. I do it through one incision, a transverse or median incision, taking care of all the pelvic pathology and then opening up the inguinal canal, shortening the ligaments, attaching them to the fascia with chromicized catgut sutures, and finally repairing the hernia if that be necessary. I have found two or three hundred cases of this kind in which the operation has given satisfactory results. Now, there will always be relapses from every kind of an operation for retrodisplacement. As pointed out by Dr. Bovée, we find that if we stitch up the uterus to the abdominal wall in a certain class of cases the uterus itself will stretch out and the cervix will appear at the vulva. We will find that after certain other operations the fundus will fall backward, but these are the exceptional cases. There will be fewer relapses after shortening the round ligaments within the canals than after any other operation for displacement.

Dr. I. S. Stone, Washington, D. C.: It seems a little remarkable that cases like these should be mentioned here and no explanation be given as to why certain displacements of the uterus are not curable. Now, take Dr. Bovée's case by way of illustration. Given a uterus whose fundus is fixed to the abdominal wall and, of course, there must be associated trouble with it, if the cervix of that uterus appears at the vulva. It would have been just as well for Dr. Bovée to state, what he knows so well, that the complications around and preceding that condition which have existed for years are the real trouble back of the displacement of the uterus. The cervix appears at the vulva in these cases, not because of its own weight, for the fundus may be attached to the abdominal wall as Dr. Bovée has stated, yet the relaxed ligaments, including fascia and connective tissue, yield before the intra-abdominal pressure from above. As has been said in other years, the reason we do not cure these patients is because we do not understand the pathology, and in the second place, we do not know how to overcome it. I feel sure that in nearly all the cases, whether in a virgin, a married woman or a multipara, the condition is preceded by a descent of the abdominal viscera. If such is the case, why should shortening of the round ligament overcome the trouble? It ought not to do it. The descent has begun in the viscera, the elongation of the so-called sacro-uterine ligaments, and the posterior pelvic peritoneum with the connective tissue has preceded the descent of the uterus. The uterus can not come down until the peritoneum and the posterior supports give way. We ought to recognize that. A great

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many of us have been trying for years to overcome the second condition first, and we have been getting the cart before the horse. How to correct the descent ought to be the object of every gynecologist instead of inventing some new method by which we can push the uterus back or hold it up. Let us have some papers on how to support the viscera, how to train the young woman so that there will not be the serious consequences to childbirth which are shown very frequently in the form of displacements which we are discussing to-day.

I would like to show why some of the ligament operations are failures. One of the reasons, which ought to be widely mentioned, is paralysis of the nerves in the ligaments which we are trying to shorten. The Alexander operation has failed because the ligaments are seriously injured by the compressing sutures. Webster and Baldy use the best part of the ligament and crush its nerve and blood supply, and when the abdomen is opened for correction of later mischief, a slender string of connective tissue is found with no muscular tissue in sight. Obviously, the ligaments should be secured without strangulation, for injuries to muscular tissue never permit a perfect restoration of function.

Dr. Henry D. Fry, Washington, D. C.: There are many different ways of treating retrodisplacement of the uterus surgically. Many men are perfectly satisfied with the suspension operation; I have had no trouble with it. Pregnancies have progressed normally and there has been no trouble at labor. But sometimes there will be fixation in these cases even when done properly, as Dr. Stone on one occasion did in the gynecologic department of the Columbia Hospital, and I had to deliver the woman afterward by Cesarean section. About fifteen years ago I was trying to find the best method of treating these cases surgically, and my thoughts ran in the direction of the Alexander operation, and I then saw Dr. Boldt operate, but the trouble he encountered led me to discard the thought of that operation. After a long search on one side for the delicate ligament and failing to find it, he went to the other side, caught the opposite ligament, returned to the opposite side and then caught it. Another objection is that the Alexander operation does not cure the complications which accompany retrodisplacement and which are the principal causes of the suffering. One of the most frequent is the prolapse of the ovary. The ovaries are down, and if the uterus is raised, leaving the ovaries down, the patient is going to continue to suffer. I have given up suspension, not from any personal dislike or from any bad experience, but simply because the profession seemed to want to get away from it and I felt that there must be good reasons. I have seen a few cases reported of intestinal obstruction, but have never had this complication.

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In looking around for another operation, I then tried the Gilliam method. The trouble with that is the suffering afterward. I find that the Pfannestiel incision—the transverse incision—is advisable in cases in which there is no pus. This incision allows the surgeon to get at the parts much more readily and the operation is much simplified.

I want to say something now in favor of the operation which is here condemned—the Webster-Baldy method. I think that it is *par excellence* the best operation for retrodisplacement; the great advantage being in the lifting up of the prolapsed ovary. The surgeon goes through the broad ligament under the utero-ovarian ligament, catches the round ligament and brings it back in a way that not only holds the uterus forward, but lifts the ovary up. Strangulation of the round ligament has been spoken of as an objection, but I think that is because the operation has been improperly done. If the whole thickness of the round ligament is fastened down it will be strangulated, and it will be a little cord in a few years, but if only half of the ligament is sewed down and the two ligaments used, there will not be atrophy, but a perfect result. In a case reported by Dr. Baldy in which he had done the operation some time before and later took out the uterus, he found that the ligaments had grown into the uterine tissue and could scarcely be seen, but a good firm ligament held the uterus in place.

Dr. Marion Craig Potter, Rochester, N. Y.: I think that as gynecologists we are not more successful in curing these displacements by treatments, because we do not get the cases early enough. Advice has always been against the examination of unmarried women, and as physicians we should re-educate the public in this matter. In young women who have severe dysmenorrhea, especially if it has existed since the first menstrual period, some obstruction exists. School physicians when reporting to parents adenoids, eyestrain and defective teeth, should also call attention to menstrual derangements. Dr. Howard Kelly advises the examination of young girls under an anesthetic, and, if indicated, operative procedures.

At this age response to remedial measures for straightening the flexed canal is much more satisfactory, whether by dilatation, Alexander operation or routine office treatment, and such measures not only cure the discomfort, but, by establishing proper drainage throughout the generative system, they prevent the establishment of a "vicious circle," which is sure to follow interference with proper drainage of the pelvic organs, viz., endocervicitis, cervitis, endometritis, metritis, bacteriologic infection from retained alkaline secretion and possibly diseases of the tubes and ovaries. As a result of this symptom-complex, we often have the most unfortunate condition that can befall a woman—sterility. From the standpoint of preventive treatment of sterility, if from no other, we

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should create a sentiment for early examination of girls suffering from dysmenorrhea.

Dr. George Ebety Shoemaker, Philadelphia: I want to speak in favor of the study of the patient, with a reservation in mind that retroversion in itself is not necessarily a condition which requires anything so important as either an Alexander operation or an abdominal section. I think operating on young women who have nothing except a retrodisplaced uterus usually is a mistake. I have always wondered how the large number of Alexander operations could be collected, and in studying my patients I could find few who required simply the reposition of a uterus. If they needed operation at all they had in addition a salpingitis, a diseased ovary, a prolapsed uterus, or some complication which called for more than the Alexander operation. The effort to determine which is the best operation, it seems to me, should resolve itself into the question: What is the best way to keep the uterus forward while the parts are returning to their normal after correcting other pathology in the pelvis? That is often a complicated problem, requiring all the knowledge of mechanics a man can summon to his aid. There is a very limited field for the fixation which has been so much condemned, and only when childbearing is impossible. It is an operation which helps bear up the badly prolapsed uterus after the other things necessary have been done, and usually a good many other things are necessary. There is a field for all the intra-abdominal shortening principles. If operating in the presence of pus and it is necessary to remove extensive adhesions which by contraction pull the uterus over backward, the surgeon cannot tear up the anterior peritoneum and inguinal canal intra-abdominally without some danger of spreading infection. In the presence of such conditions one of the other methods must be used. Light suspension in front of the line joining the cornua, I have done for several years with no unfavorable result. The round ligaments may be attached to the uterus behind, or some modification of the Gilliam operation may be used. I want to emphasize the necessity of the study mechanically of each combination of conditions and to state that we should very rarely operate simply for retroversion.

Dr. A. E. Benjamin, Minneapolis: It was the purpose of my paper to bring out a discussion, because I think this subject should be settled. Gynecologists should be agreed concerning the best operation to be performed. If these patients could be seen early, as Dr. Porter stated, before there were many complications, much could be accomplished. We should know whether there was visceroptosis or a greatly dilated stomach pushing down all the abdominal and pelvic organs and necessarily causing retrodisplacement of the uterus. If we could teach young girls how to overcome this condition there would be little necessity for an operation, except for complications,

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as some disease of the tubes and ovaries. Many patients will develop prolapse of the ovaries because of this continuous crowding of the organs down in the pelvis. I agree with most of the speakers regarding the principles underlying this subject. I cannot agree with men who believe that ventrosuspension should be done, although I have done it myself; I no longer do it because of the possibility of obstruction of the bowel from the false ligament.

I do not agree with those who believe the Webster operation, or those operations which shorten the round ligament within the abdomen, are ideal. As has been said, they use up the best part of the ligament. There is constriction of the uterus and interference with the blood supply. The idea of my operation is to utilize the same principle involved in the Alexander operation. The skin is dissected back from the fascia and a forceps run down through the tissue in the region of the internal abdominal ring; the round ligament is caught, pulled out, spread out and fastened to the abdominal fascia. The uterus is firmly supported and there is no pain or other trouble following the operation. I find that in this operation I can do a transverse incision nicely, especially in young women, by making a cut at the upper border of the pubic hair line. I carefully examine every patient to see that there are no other conditions to consider than the retrodisplacement.

If the abdominal muscles are relaxed with prolapse of the abdominal organs, I have these patients take exercise, put them in the knee-chest position, put on a long straight front corset, and then I find that gradually the organs assume the normal position.

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THE ENDOMETRIUM AND SOME OF ITS VARIATIONS

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It is surprising to note how few sharply defined and generally accepted facts have been crystallized out of the great amount of work which has been done on the histology and pathology of the endometrium. The numerous classifications of endometritis, for example, are ample evidence that none is entirely satisfactory, while some, as a matter of fact, are little short of absurd. Particularly unfortunate have been the attempts to classify endometritis along clinical lines, and it seems to have been decided that the most satisfactory or, at any rate, the least unsatisfactory basis for classification is a histologic one.

In this brief communication we propose first to present the results of our studies on the normal histology of the endometrium, with especial reference to the modifications thereof which are associated with the menstrual cycle. It is not our intention to take up a consideration of the various diseases of the endometrium, except in so far as our conception of these diseases may be influenced by our knowledge of normal variations in the structure of the uterine mucosa.

Our general study is based on the microscopic examination of the uterine mucosa from over 200 cases in the gynecologic clinic of the Baltimore City Hospital during the past three years. In the majority of these

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cases the mucosa was obtained by curetting, in a smaller number by extirpation of the uterus for one reason or another. In all cases the material was fixed immediately after removal, and the stain employed, with few exceptions, was the ordinary hematoxylin-eosin method.

In order to study the menstrual phenomena there was selected from the entire number of cases a series of 50 in which an accurate record of the menstrual history was available, including the date of the menstrual onset and usually of the termination of the period preceding the operation. In some of this group the material was obtained by routine curetting in connection with plastic operations of one form or another, there being no evidence of uterine disease. In other cases the mucosa was obtained from cases complicated by various associated conditions, such as myoma, salpingitis, displacement, etc., although no case was admitted to the series unless the regularity of the menstrual cycle was undisturbed.

In the main, therefore, the conditions surrounding our work have been similar to those under which was carried on the valuable work of Hitschmann and Adler,[1] to which we shall have frequent occasion to refer.

In order to appreciate the change which recent investigations have produced in our conception of the normal structure of the endometrium one need only read the descriptions contained in the various text-books of gynecology and anatomy. In the usually accepted sense the endometrium is the corporeal portion of the uterine mucosa, i. e., the portion above the level of the internal os. It is usually described as consisting of a surface epithelium, glands, and an interglandular tissue or stroma. The epithelium is of the ciliated columnar variety, differing from that in the cervix in that the cells are not so tall and slender, that the nuclei take on a paler stain and are situated near the center of the cells instead of near the basement membrane, and that

1. Monatsh. f. Geburtsh. u. Gynäk., 1908, xxvii, 1.

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the protoplasm takes on the eosin stain, while that in the cervix not infrequently takes a pale hematoxylin stain on account of the excessive amount of mucus which it contains. The glands are described as being of the simple or branched tubular variety, being lined by epithelium continuous with and similar to that of the surface. The stroma, according to most authors, consists of a delicate reticular network of fibrillar connective tissue containing in its meshes large numbers of round, oval, or spindle-shaped cells. At the present time there is no unanimity of opinion as to the exact nature of the stromal tissue. Nagel[2] and Waldeyer[3] believe it to be of a lymphoid type and compared it to the stroma of the intestinal mucosa. Leopold[4] regarded it as a spread-out lymph gland (*Lymphdrüsenfläche*), while Johnstone[5] believes that it is of an adenoid type. Most of the best authorities, however, accept the view of Minot, that the stroma is merely a form of embryonic connective tissue, and this is probably the correct one.

From a physiologic standpoint the endometrium bears an important relation, whether active or passive, to the function of menstruation, and it would be interesting, if time permitted, to trace the various views which have at different times been held as to the changes which take place in the endometrium at the time of menstruation.

Unfortunately, up to recent years, the extent of these changes had been gauged largely by the comparative study of menstruating and non-menstruating uteri, and there had been no systematic effort to study the histologic structure of the endometrium from the beginning to the end of the menstrual cycle. Within the past few years, however, an important contribution to our knowledge of this subject has been made by Hitschmann and Adler,[1] whose work bids fair to revolutionize our former

2. von Bardeleben: Handbuch der Anatomie des Menschen.
3. Quoted by Williams: Text-Book on Obstetrics.
4. Arch. f. Gynäk., xi.
5. Brit. Gynæc. Jour., November, 1886.

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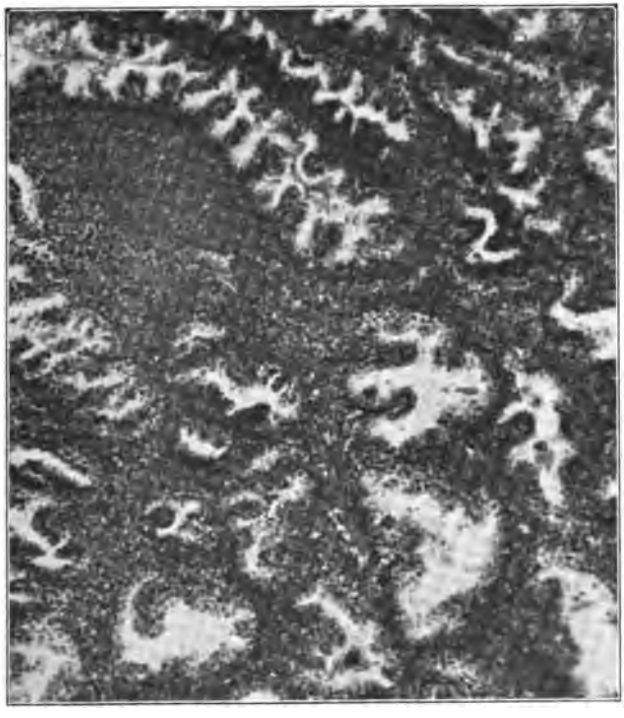

Fig. 1.—No. 749 (low power). Showing premenstrual gland changes. Note the increase in size and tortuosity and "saw-like" appearance of the glands. Curetting done one day before menstruation.

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ideas of the histology and pathology of the endometrium. These observers, after a painstaking study of the uterine mucosa from fifty-eight women at various periods of the menstrual cycle, found that the endometrium, from the cessation of one menstrual flow to that of the next, presents a constantly-changing histologic picture. This cycle of changes they divide into four phases: postmenstrual, interval, premenstrual, and menstrual.

At the height of the menstrual flow the mucous membrane diminishes in thickness and the glands pour out their secretion, becoming narrow and straight. The surface epithelium is frequently lost, but this is not an invariable rule. After the period there takes place a very rapid cell growth in both the epithelium and connective tissue. The glands become larger and wider, although still quite narrow and straight. The epithelium is low and in a condition of rest. By about the fifteenth day the cell growth of the epithelium has progressed to such an extent that the glands become somewhat tortuous, and often assume a spiral or corkscrew-like appearance. Finally, six or seven days before the beginning of menstruation, the glands rapidly enlarge and become tortuous, the cells bulge into the lumen, the epithelium becomes higher and broader, and the lumen is filled with a mucous secretion. These gland changes are much more marked in the deeper portion of the mucosa than in the superficial, so that there is produced a well-marked differentiation into a superficial compact and a deep spongy layer. In this respect there is a marked similarity to the appearance of the young decidua, the resemblance being increased by the fact that the interglandular stromal cells in many cases assume an appearance very similar to or approaching that of decidual cells.

The important work of Hitschmann and Adler has attracted a great deal of attention, and already a number of articles, mostly confirmatory, have been published on the subject. From our own study of the fifty cases

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selected for this purpose we have been able to convince ourselves of the correctness, in the main, of the conclusions arrived at by Hitschmann and Adler. In our series of 50 cases we found that from a histologic standpoint 13 were to be classified as belonging to the premenstrual group. All of these 13 showed a marked increase in the size and tortuousness of the glands, some exhibiting a high degree of "papillary" formation, others presenting the less advanced saw-like appearance. In 10 of these cases the mucous membrane had been removed at short periods before the beginning of menstruation. In 5 cases the interval was one day (Figs. 1 and 2), and in the other 5 cases it was three, four (Fig. 3) six, seven and nine days respectively. The remaining 3 of the group of 13 cases which exhibited the so-called premenstrual glandular changes are especially interesting in that in all of them operation had been done at a period quite remote from the menstrual period. In one specimen (Gyn. Path. No. 262) the curetting had been performed eight days after menstruation and yet there were many hypertrophic glands throughout the section. As a whole the specimen was not absolutely typical of the premenstrual period, but in certain fields the appearance was quite characteristic. The other two specimens (Gyn. Path. No. 611 and Gyn. Path. No. 717, Figs. 4 and 5) were obtained eleven and ten days respectively after menstruation, and in both the glands presented very decided hypertrophic changes, Gyn. Path. No. 611 especially being typical in every way. Of these three typical cases Gyn. Path. No. 262 was complicated by laceration and hypertrophy of the cervix, a moderate prolapse of the uterus and a small myoma. Gyn. Path. No. 611 was associated with a unilateral salpingitis and Gyn. Path. No. 717 with a laceration of both cervix and perineum.

The fact that premenstrual changes are found at a period so remote from the menstrual epoch, as in these cases, might perhaps be explained on the assumption of

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an individual peculiarity—as perhaps indicating an unusually early appearance of the glandular changes of the premenstrual period. This seems to us, however, as little more than an evasion of the question, and we feel that a simpler and more plausible explanation can be invoked. In view of the fact that the menstrual process, whatever its underlying cause may be, has as its most striking phenomenon the vascular changes in the reproductive organs, it is not unreasonable to assume that the constantly changing histologic picture in the endometrium is only a result of the influence of the increased blood suply on a very susceptible and readily-reacting tissue. The interesting experiments of Federn[6] and others have shown that the blood pressure of a woman reaches its maximum at the premenstrual period, the onset of menstruation being characterized by a rapid fall, after which the pressure rises gradually again to its high point at the next premenstrual period. The blood-pressure curve is therefore parallel with the histologic changes, and it is only natural to suppose that the latter may be largely influenced by the variations in the blood supply of the pelvic organs at different phases of the menstrual cycle. It seems logical to believe, however, that while the normal physiologic stimulus for the hypertrophy of the uterine glands is supplied by the hyperemia of the menstrual process, the artificial stimulus furnished by a pathologic hyperemia may also produce a greater or less degree of such change. The finding of marked hypertrophy of the uterine glands at other than the premenstrual period may thus be explained, although the factor of individual susceptibility must after all play an important part, for the occurrence of hypertrophied glands even in cases characterized by prolonged pelvic congestion is by no means constant.

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6. Blutdruck und Darmatonie, Vienna, 1894; quoted by Hitsch-

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Hartje[7] has recently employed the term *"subinvolutio mucosæ menstrualis"* to indicate the persistence of premenstrual glands for the first few days of the regeneration period. This, he suggests, may be due to a deficiency of the retrogressive changes normally occurring in endometrium after the onset of menstruation. We believe that he is correct in his opinion that the occurrence of the premenstrual picture in the period of from nine to fourteen days after menstruation is to be regarded as certainly pathologic.

Shickele,[8] in a recent article, also asserts that marked gland changes may occur without any relation to the menstrual process, as a result of uterine disease, adnexal affections, and displacements. In a rather large series of cases characterized clinically by bleeding (menorrhagia or metrorrhagia) in which it was difficult or impossible to determine the menstrual dates, we found marked glandular changes in a considerable number. Concerning this series we hope to report more fully at a later date. Kubo[9] likewise found gland hypertrophy, often very marked, in twelve of the ninety-nine cases of menorrhagia and metrorrhagia.

Whatever the explanation of the occurrence of gland changes under such circumstances may be, therefore, there seems to be no doubt that they may occur, and whether we characterize such changes as glandular hyperplasia or glandular endometritis, their pathologic nature should be recognized. The old rule of Gebhard, that the glands should be considered abnormally numerous if the distance between them is less than four or five times the diameter of the glands, is a very misleading one, for there are marked normal differences in different mucosæ in this respect. Moreover, in the examination of curettings, the microscopic appearance as to this

7. Monatsh. f. Geburtsh. u. Gynäk., 1907, xxvi, 15; Zentralbl. f. Gynäk., 1907, xxxi, 1465.
8. Beitr. z. Geburtsh. u. Gynäk., 1909, xiii, 358.
9. Am. Jour. Obst., 1908, lvii, 675.

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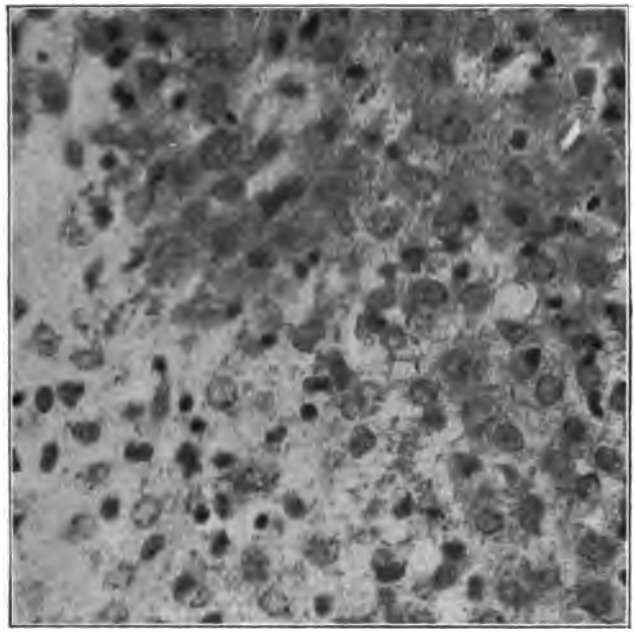

Fig. 2.—No. 57 (high power). Showing decidual transformation of the stromal cells. Curetting done one day before menstruation.

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Fig. 3.—No. 647b (low power). Showing the straight collapsed glands of the post-menstrual period. Curetting done four days after menstruation.

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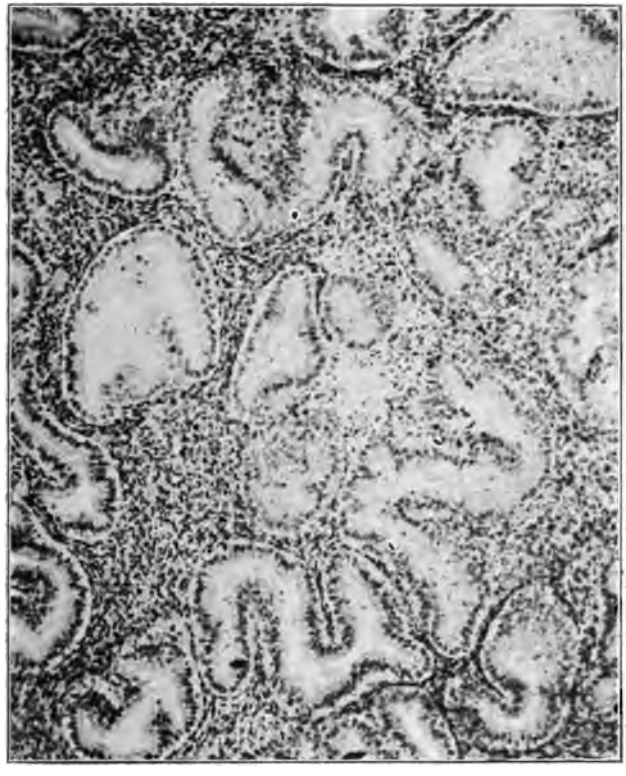

Fig. 4.—No. 611 (low power). Showing so-called premenstrual gland changes at a period eleven days after menstruation. Clinical condition, unilateral salpingitis.

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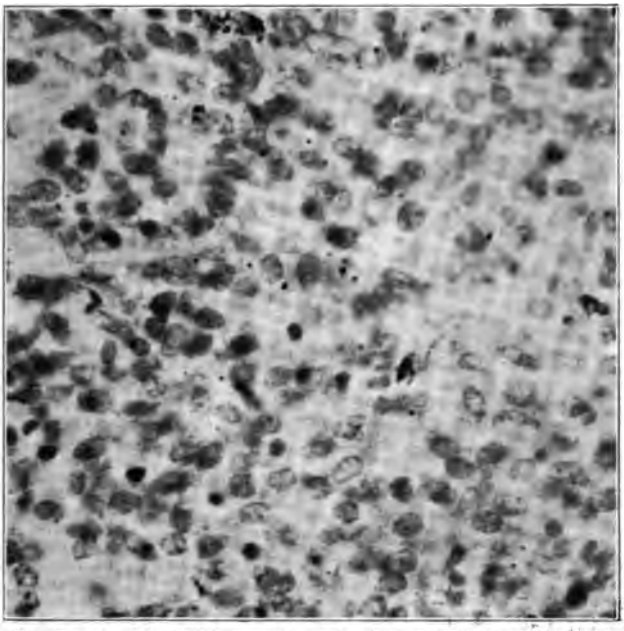

Fig. 5.—No. 717 (high power). Showing decidual transformation of cells at a period ten days after the menstrual period. Clinical condition, laceration of the cervix and subinvolution.

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point varies in different portions of the endometrium, and even more at different depths of the mucosa.

When one considers the individual variations in different women, with regard to the duration and amount of the menstrual flow, it is only natural that there should also be rather wide variations in the degree of gland change, exhibited at the premenstrual period.

As Hartje has pointed out, there is a gradual progression from the straight collapsed gland of the premenstrual period to the gland type of maximum differentiation—the gland with papillary outgrowths and secondary alveoli. In the most marked cases the glands of the deeper layer are markedly widened, the stroma is diminished so that the glands are almost in contact, and the epithelium is swollen with secretion. Many of the glands show well-marked papillary projections into the lumen, or in the less marked cases take on merely a saw-like appearance *(sägeförmige Drüsen)*. Such glands as these were at one time considered pathognomonic of pregnancy (Opitz[10]), although the recent investigations of Hitschmann, Leitz,[11] Schwab[12] and others have shown clearly that this is not the case. The last named observer, for example, in an examination of a series of 41 curettings, found Opitz's "pregnancy" glands in 5 women, and, of these 5, only 1 was pregnant, the other 4, however, having a definite relation to the menstrual process—3 premenstrual and 1 menstrual. We have repeatedly seen such glands in the premenstrual mucous membranes of non-pregnant women. According to Hartje, the maximum gland changes, with papillary formation, etc., are seen in about one-third of the cases, the remainder showing merely the tooth-like or saw-like appearance characteristic of less advanced stages.

No less interesting than the gland changes of the menstrual cycle are those which take place in the interglandular substance or stroma. As already mentioned,

10. Ztschr. f. Gynäk., xlviii.
11. Ztschr. f. Gynäk., l.
12. Ztschr. f. Gynäk., 1904, p. 1425.

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Hitschmann and Adler found that in many cases the stromal cells assume an appearance so like that of decidual cells that there is no possibility of distinguishing them. When one considers that the decidual cell of pregnancy, according to the generally accepted opinion of the present day, is merely the overgrown stromal cell of the endometrium, such findings can scarcely be wondered at. It was Ruge (1880) who first stated that decidual cells may occur entirely independently of pregnancy, but it was not until recent years that the full significance of this view has come to be recognized.

In our series of 50 cases there were 4 in which the decidual modification of the stroma cells was sufficiently marked to be conspicuous. All of these occurred among the group of 13 cases in which the glands exhibited premenstrual changes. Among them, however, was one (Gyn. Path. No. 717), already alluded to, in which operation was done only ten days after menstruation, so that from this it would seem that other influences than normal menstruation may perhaps be capable of producing a decidual modification of the stromal cells.

A number of observers, notably Löfquist,[13] have found decidual cells present to a more or less marked degree independently of pregnancy, in association with such conditions as adnexal disease, tumors, displacements, etc. In most cases, unfortunately, the value of such observations is lessened by the failure of the authors to recognize the possible influence of menstruation in producing a decidual modification of the stromal cells. In a few of the recent reports, such as that of Goodall, however, this possibility seems to have been borne in mind, and it is quite probable that the stromal changes, as well as the gland changes, may be brought about by various conditions other than normal menstruation, such as inflammatory disease, displacements, tumors and tuberculosis. This would seem to be in

13. Zentralbl. f. Gynäk., 1901, xxi, 552.

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keeping with the biologic law that the natural result of over-nutrition of tissue is overgrowth.

As in the decidua of pregnancy, the stromal changes of menstruation are seen most conspicuously in the superficial compact layer of the endometrium, these changes being just as characteristic of the premenstrual period as are the glandular phenomena already described. Like the latter, they reach their highest development just before the beginning of the menstrual period. According to Hartje, the decidual-like cells (*decidua-ähnliche Zellen*) are seen in about one-third of the premenstrual cases. All stages of development are seen, from the normal stroma cell, which contains practically no protoplasm, to the typical decidual cell with its large oval nucleus surrounded by a well-marked protoplasmic area.

Even those who maintain that there is an essential difference between the decidua-like cells of menstruation and the true decidual cells of pregnancy have not been able to define wherein the difference lies. The conclusion is forced on us that the modified stroma cells of menstruation (*Uebergangzellen*) are simply different stages in a series in which the true decidual cell represents the maximum development. As Löfquist says, all the commonly observed changes in the endometrium may be regarded as the response of tissue to stimulation —as varying degrees of what has been called the "decidual reaction."

Such observations as these throw a new light on the question of membranous dysmenorrhea. We have in our work observed two cases in which the membrane expelled from the uterus on microscopic examination showed the presence of characteristic decidual cells, even though, in the light of the clinical history, there was little or no possibility of pregnancy. Many similar cases have been recorded, and, with our knowledge of the extent of the menstrual phenomena in the endometrium, they are not so difficult to explain. Such cases are no

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doubt due to a throwing off of the superficial layers of the endometrium at the menstrual period, in a manner analogous to the expulsion of a true decidua. The exact cause and the mechanism of the process are still uncertain. The fact that dysmenorrhea membranacea is associated with an extensive shedding of the endometrium would not, however, seem to be a justification for the generalizing assertion advanced by some that such a loss of tissue is the rule in normal menstruation. The early writers, especially Kundrat,[14] believed that menstruation is attended with such extensive or even complete loss of mucosa, but the investigations of Gebhard and others seemed to demonstrate that, as a rule, there is very little loss of tissue during the process. More recently Hitschmann and Adler,[15] Ehrenfest,[16] and others have asserted that the views of Gebhard are not correct, and that there is often a considerable loss of substance during menstruation. The question, however, is still far from being definitely settled, and it is probable that there are marked individual variations in different cases.

The important bearing of this knowledge of the histologic changes corresponding to the various phases of the menstrual cycle can scarcely be overestimated. It at once places an interrogation mark after such terms as endometritis glandularis hypertrophica and endometritis glandularis hyperplastica, and deals a final blow to the early belief in the pathognomonic importance of the decidual cell in the diagnosis of pregnancy. While we are convinced of the correctness of the observations of Hitschmann and Adler on the changes which take place in connection with the menstrual cycle, we feel that their division of the cycle into phases is too schematic for ordinary use, and we do not believe that, as these writers assert, the changes characteristic of the various phases are so sharply defined that the time

14. Med. Jahrb., Vienna, 1873.
15. Monatschr. f. Geburtsh. u. Gynäk., 1908, xxvii, 200.
16. Am. Jour. Obst., 1908, lxiii, 412.

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relation of the endometrium to the menstrual process can be determined from the microscopic picture "with accuracy and often to the day."

Finally, from the study of our own cases and from the reports of other authors, we believe that Hitschmann and Adler have taken an extreme view in practically asserting that glandular changes do not occur except in connection with the menstrual process. Both animal experimentation and clinical observation indicate that the actual underlying cause of menstruation is the secretory activity of the ovary, which produces an internal secretion or hormone essential for its occurrence. The principal effect of this substance seems to be of a vasomotor nature, and is exerted especially on the pelvic blood vessels. It is only natural to suppose that the endometrium plays a purely passive rôle in this phenomenon, and that the histologic changes observed in connection with menstruation represent merely the reaction of the endometrium to the process—a reaction which may, however, be elicited by other influences than that of normal menstruation.

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ABSTRACT OF DISCUSSION

Dr. Henry O. Marcy, Boston: Twenty years ago I translated the works of Prof. G. B. Ercolain of Bologna, Italy, who commences his studies in the lower animals, showing that nature during the whole reproductive life is making ready for the continuation of the species. His work shows clearly from his standpoint that there is a process in every menstruation leaving a new mucous membrane with a new possibility of a reproduction of a new material for the development of the species, and that only in this way is impregnation possible. The placenta, in all animals, including the human species, consists of two distinct, fundamental parts, the fetal portion being vascular and absorbent, the maternal, glandular and secretory. In no case do the vessels of the mother anastomose with the vessels of the fetus. The transformation which the uterine mucous membrane undergoes during pregnancy produces the neoformation of a transitory glandular organ of secretion, constituting the material part of the placenta.

Dr. John G. Clark, Philadelphia: It is gratifying to know that laboratory workers in America have taken up the inter-

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esting studies of Adler and Hitchens for verification or elaboration. Three years ago this section appointed a committee whose duty it was to offer a simplified nomenclature for endometritis. Great difficulty was encountered in arriving at conclusions, either from the clinical or histologic standpoint, for each writer was inclined to base his nomenclature on personal observations rather than on a uniform conception of this subject by the clinician and histologist. In the light of present investigations it is apparent that this failure in unanimity of opinion is due to the fact that the cyclic changes of the endometrium incident to the menstrual epoch were not then recognized. According to the investigations of Adler and Hitchens, which apparently Drs. Gardner and Novak have largely sustained, the tiny uterine glands, which are collapsed and almost straight immediately after menstruation, go through a definite evolutionary process, during which they increase in size, capacity, and histologic hypertrophy. In view of these cyclic changes it is evident that many of the discrepancies which have been noted by various histologists may be ascribed to the difference in the size and constituence of the glands during the twenty-eight day epoch. Many clinicians have looked askance at a histologic diagnosis, particularly when their clinical sense has been opposed to malignancy. I have always taken the ground that a careful clinical diagnosis is worth more than an inefficient histologic study, especially if the microscopist is not particularly skilled in this special line of pathology. I am sure that many uteri have been removed under the suspicion of malignancy in cases in which what was taken for hypertrophy of the glands or early malignancy was merely due to physiologic changes.

Clinically, therefore, I am sure that this most interesting study, which has been so well presented by Drs. Gardner and Novak, will have a very beneficial effect in the further histologic simplification of the changes in the endometrium. If the microscopist takes into account these changes, and if we, as clinicians, are careful to indicate to him the date of the operation as related to the last menstrual period, we will not lay him open to the error of sending back word to us that the glands are hypertrophied or suspicious of malignancy, when they are merely undergoing physiologic changes. The classification of endometritis will also be greatly simplified and placed on a more scientific basis by these careful studies.

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THE PRESENT STATUS OF IRRIGATION AND DRAINAGE IN OBSTETRIC AND GYNECOLOGIC OPERATIONS

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Though there may never be complete unanimity of judgment and opinion regarding the details of the requirements for irrigation and drainage in gynecologic and obstetric operations, there is a growing disposition among us to simplify our practice in these particulars. This has come about through the gradual elimination of the sloppy flushing practice of a few years ago and the abandonment of things like huge glass drains and suction syringes.

A process of evolution by exclusion has simplified the approved practice of today, and in both obstetric and gynecologic operations better results have been obtained with the simpler methods.

The use of solutions of antiseptic drugs, particularly those of the poisonous varieties, is steadily losing favor. The practical antiseptic efficiency of such solutions for irrigation is questionable and the dangers incident to their use are known and recognized. Not only have serious poisonings occurred but deaths from poison have resulted from this practice, and the diffusion and distribution of a previously localized infection has not infrequently occurred. An example of these dangers is afforded by cases in which uterine perforations have accidentally been made during a curettement following abortion, and a solution of bichlorid of mercury has

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been thrown into the peritoneal cavity through the uterine rent. In this event chemical poisoning and the distribution of the infection both take place. I have knowledge of one such instance; many may be found in medical literature, but for obvious reasons most of such unfortunate occurrences have not been reported.

Irrigation is doubtless best employed for its mechanical effect in washing out of the body such loose debris as the cavity being treated may contain. To this end the force employed should be at the minimum for efficiency and the solution used the least irritating possible.

The elementary principles governing the best modern obstetric and gynecologic practice would seem to be about as follows: Never irrigate if it be possible to avoid it through gentle wiping or sponging. Avoid poisonous and irritating solutions, as they are both dangerous and disappointing. In the main, use irrigation for its mechanical effect in flushing out debris, and always at low pressure.

Summarizing the prevalent opinions of today as to drainage in obstetrics and gynecology one finds it contrasting strongly with opinions and practice of but a few years ago, and happily, also, in the direction of simplification. One now finds himself disposed to avoid the use of drainage wherever possible and believes it possible to do without it many times where it was formerly deemed an absolute necessity. So, too, our ideas of drainage methods have undergone a change for the better. Glass drains are now rarely used even in the abdomen, and by only a very few operators. Gauze, always an indifferent drain, is more often employed for packing and walling off infected areas, arresting oozing of blood which may otherwise be difficult to control and for guarding against fecal and urinary infiltration into the tissues, and leaks into the cavities of the body when the hollow viscera have been injured or sutured.

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The majority of the best surgeons of today limit the use of intra-abdominal irrigation and drainage to few and to certain specific indications, chief of which are rupture or leakage from some hollow viscus or localized abscess which has poured into the abdominal cavity food, urine, pus or blood in considerable quantities.

In certain cases of ruptured ectopic pregnancy irrigation serves the double purpose of flushing out the clots and debris and supplying the body with much needed fluid for the heart and blood vessels to act on. Also, in certain cases of shock, a normal salt solution instilled into the peritoneal cavity may act well; but that is not the particular phase of the subject this paper is intended to consider.

It is now generally appreciated that some localized accumulations of pus, particularly those of long standing and of tubal origin, may be safely broken down and turned out through an abdominal incision without irrigation or drainage even though the adjacent surfaces be extensively soiled. Indeed the plan of coffer damming and wiping out with dry gauze is believed to give much better results in such cases than did the older practice of irrigation and intra-abdominal drainage. So, too, certain localized peritoneal infections originating in the appendix are better treated without irrigation and intra-abdominal drainage even though the appendix may have ruptured and the adjacent loops of intestine be injected and mottled with many patches of lymph. Often in such cases the peritoneum will take care of its end of the infection without a protest, though the wound in the abdominal wall may suffer a serious infection which, if unprovided for by a superficial drain down to the peritoneum, may cause great anxiety. The interesting pathologic problems of established immunity on one hand and attenuated virility on the other are important factors under such circumstances, but these also lead us far afield and into a

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consideration of deeper mysteries than we are prepared to undertake to explain.

Whenever intraperitoneal drainage is really necessary in gynecologic surgery it is certainly better to make it from the bottom of the wound and "down hill" if possible; that is, through the vaginal vault. This plan has so many evident advantages other than the predisposition to hernia which a deep drain through the abdominal wall favors that they need not be enumerated.

Intrauterine irrigations in gynecologic and obstetric surgery have been illogically practiced for more than a generation, and even now poisonous solutions are constantly employed by many physicians who are doing curettements after abortions or after delivery at term, notwithstanding the fact that most of the recent authorities have shown them to be ineffective for good and capable of doing great harm.

The routine employment of such intrauterine douches after uncomplicated normal labors is also advocated and practiced, though the weight of evidence is overwhelmingly against it. In Williams' "Obstetrics"[1] may be found this statement:

> It has been shown experimentally by Bumm that mercuric chlorid injections penetrate the tissues only to a very slight extent. He took the liver of an animal dead of anthrax, and after soaking it for thirty minutes in a 1 to 1,000 mercuric chlorid solution, placed it on a freezing microtome, and cut thick sections from it. After cutting off about 1 mm. he inoculated the next section into another animal which succumbed to anthrax, thus showing that the germicidal action of mercuric chlorid had been exerted only on the surface. If this be the case in the laboratory after the tissue has been immersed in the antiseptic solution, what effect can be expected on organisms embedded in the muscular wall of the uterus, from a transitory application to the surface of a few liters of a weak mercuric chlorid solution? Bumm likewise showed that the streptococci made their way through the uterus with great rapidity, traveling 2 cm. or more in the space of six hours. What has been said concerning mercuric chlorid applies equally well to the other disinfectants.

1. Obstetrics, 1908, pages 885-886.

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Notwithstanding the frequent reiteration of statements like that just quoted in almost all the recent standard text-books on obstetric and gynecologic subjects, many general practitioners and not a few gynecologic and obstetric surgeons persist in the use, or rather the abuse, of the poisonous intrauterine douche. Proof positive has been offered time after time of the fallacies and dangers of the poisonous antiseptic intrauterine douche and there is practical unanimity of opinion among teachers and writers that its effects can be nothing but bad, and yet it is employed constantly by many who should know how dangerous it is.

What is there about the practice of the obstetric art that makes the average man so impervious to incontrovertible proof? Our reluctance to accept the truth in regard to the contagiousness of puerperal fever for almost a half century after it had been logically proved is an indictment under the shadow of which we should long stand in deep humility and in atonement for which all our efforts should be exercised in a determination henceforth to keep our minds open to conviction.

Intrauterine drainage is, under some circumstances, a most important surgical detail, but, so far as I have been able to observe, it is rarely employed logically or with a proper regard for the mechanical principles involved in the attainment of the ends sought.

From a mechanical standpoint, a tampon is little more of a drain than a dam is an aqueduct in hydraulics. If the conditions inside the uterus are such as to demand drainage in the true sense in which the word should be used, a gauze tampon, or even a gauze wick, if that term be preferred, does not meet the indications. The capillary action of gauze is incapable of carrying off under any circumstances more than the thinnest fluids, and even those only for a short time, as the meshes of the gauze soon become filled and its capillarity is destroyed. The principles of true drainage require that the drain shall be open and free; that it shall be capa-

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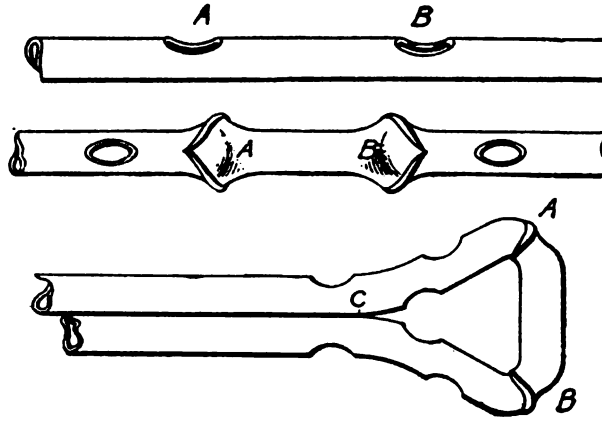
ble of conveying thick fluids, such as pus, blood, mucus or necrotic debris, and that it be capable also of being flushed and freed while *in situ.*

Such a drain is often invaluable in the uterine cavity, as it may be in many other situations; but, with the known tendency of the internal os to contract and so retain within the uterus putrescible or infected material, a free drain adapted to flushing and capable of conveying thick fluids is a necessity. Such a drain I devised some years ago and my experience with it has been such that I venture to speak of it here, not-



1. Cut two holes in a long piece of drainage tubing as indicated at A and B. 2. Draw one end of the tube through A and out at B, thus inverting that portion of the tube between the holes as seen in 2. 3. Bend the legs of the tube down so that the holes A and B will be left open for drainage. If bent in one direction they are open, if in the other closed. Tack with a blind stitch at C.

withstanding previous mention of it elsewhere. It is made of rubber tubing of a size adapted to the requirements of the case in hand and of thick or thin walled tubing, depending on the pressure it must withstand from without. It may be adapted to bladder irrigation and drainage, as it makes an admirable and easily constructed retention catheter out of material always at hand and one that can be readily introduced and removed. It works equally well after operations for perin-

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eal or suprapubic prostatectomy and for draining the pleural cavity it is admirable, but as an intrauterine drain in infection, sapremia, etc., it has been found most useful. The accompanying drawing and legend will best describe its construction.

One of the most dangerous features of the ordinary intrauterine douche as it is commonly employed is the necessity for frequent and repeated introductions of the irrigator through the infected vagina and cervix with all the risks of a retrograde infection that necessarily attend such a proceeding. When practiced by the physician or nurse several times a day, as is sometimes done, it is inconceivable that the vaginal, cervical, or vulval bacteria are not conveyed into new fields during the operation and the patient may be congratulated if she does not also receive some new infection from the hands or instruments of the operator

Such retrograde infections of the bladder are of common occurrence as a result of the repeated use of the catheter, even though the opportunities for cleansing the field are good.

The advantages of an irrigating and draining device which may be placed once, and once only, with due precautions against infection and through which the drainage and the flushing fluid may always flow from within outward must be apparent, whether the cavity to be flushed and drained be that of the bladder, the uterus or the pleura. This flow from within outward is accomplished in a most satisfactory way by the tube shown. When used with diluted alcohol, according to the suggestion of Carosso,[2] or with sterile water, salt solution, a solution of potassium permanganate or a dilute iodin solution, it may be a means to a most desirable end.

Through these tubes an intermittent flushing of an infected uterine cavity may be made by a nurse at fre-

2. Wetherill: Am. Jour. Obst., 1903, xlvii, 5; Am. Med., Jan. 30, 1904, p. 189.

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quent intervals without changing the position of the patient in her bed, or, indeed, it may be done without waking her if she should be asleep, as one of the legs of the tube can be permanently connected with the reservoir containing the flushing fluid and the other with the receptacle beneath the bed, so that the fluid can be carried into and out of the uterine cavity by continuous flow, if that should become necessary, and be stopped or started at will with a simple pinch cock.

Dilute alcohol solutions (33 per cent.) so used have given astonishing results in the after-treatment of sapremia and uterine and vaginal infections.

With this simple device for drainage and a continuous flow of boric acid solution at low pressure success has also attended efforts to close large vesicovaginal fistulas in badly infected bladders, one person having been previously unsuccessfully operated on eleven times during twelve years. Success in this instance was made possible by the perfect draining of the bladder and the prevention or solution of the ammoniacal urinary concretions and incrustations which had been deposited on the catheter and bladder walls in her previous operations.

Drainage, real drainage, of the uterus and bladder under certain conditions may be indispensable.

When irrigation of these cavities is necessary it should be made with non-poisonous solutions, and in the main with a view to their mechanical effect in flushing the cavity as in contradistinction to their chemical and antiseptic effect.

Low hydrostatic pressure should be employed and ample provision must be made for the return flow of the flushing fluid.

ABSTRACT OF DISCUSSION

Dr. I. W. Potter, Buffalo: While douching following normal labor has its disadvantages and is said to be dangerous under certain circumstances, I think it also has its advantages.

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and with me it is a routine practice. I do it myself, but never do it more than once in each patient.

Dr. W. W. Golden, Elkins, W. Va.: I wish to add my testimony from a somewhat extensive experience to the utility of the use of douches of solutions of iodin. This solution serves a useful purpose, especially under certain conditions in which the general practitioner often has to work, when it is not convenient or possible to exercise and practice proper aseptic precautions in intrauterine manipulations. The use of iodin solutions a little stronger than usually recommended has proved satisfactory in my hands and in the hands of a number of physicians who have followed my suggestions.

Dr. Edward J. Ill, Newark, N. J.: In considering the question of drainage of the uterus we must remember that the uterine cavity is not a hollow space, that the walls come together. No irrigation tube will separate these two surfaces sufficiently to keep the cavity perfectly clean. To do it well, the much-maligned gauze should fill the uterus. If the physician will separate those two uterine walls by gauze and through the center of it put a rubber tube up to the fundus with an opening at the end and pour a 25 per cent. solution of alcohol through it once in three hours, he can thoroughly cleanse the uterine cavity without in the slightest disturbing the patient. These septic surfaces are constantly bathed with a 25 per cent. solution of alcohol. Ahfeld describes scientifically the importance of disinfection with dilute alcohol. I have used this method for fifteen years and whenever I get hold of a patient within two or three days of the infection she recovers. If I get the case later than that, the infection has entered the lymphatics or the veins and the results are not so certain, though in many cases they are satisfactory. At the end of five or six days the gauze and tube are removed and the gauze is found to be just as clean as when it was put in. This gauze is not foul and ill-smelling and filled with all sorts of discharges from the uterine cavity.

Dr. Henry D. Fry, Washington, D. C.: I protest against what has been said about the use of intrauterine douches after normal labor. I am sorry that the doctor who said there were certain advantages to be derived from it did not state what they were, and I can not see what the benefits are. If the labor is normal and the uterine cavity is not infected there is danger of carrying infection into the uterus by douching it. This method has been tried and we know that the morbidity and mortality have both been increased by the use of the intrauterine douche when there is not distinct indication for its employment. I agree with the essayist that it seems to be very difficult to stop this practice among obstetricians; men who are supposed to be conversant with the best methods of treatment and that they will continue to use the curette also, which I think is dangerous, unless clearly indi-

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cated. I think there are distinct indications for it in some cases—infection, especially of the saprophytic kind, also septic endometritis, and when débris, foreign matter and clots have been retained. I think the effect is just as good from the use of normal salt or sterile water as from an antiseptic solution. It is the mechanical effect of the water that does good. If there is colon infection the douches are good. In streptococcus infection there is no advantage in the use of the douche. If streptococci are found, let the uterus alone after a preliminary cleansing.

One point not mentioned and which has given me much trouble is in connection with the vaginal operation for ectopic gestation with extraperitoneal hematocele; in which one opens through the vault of the vagina and through the sac, to get out broken-down tissues and clotted blood. I clean out and put in a double drainage tube, but I have not been able in a single case to prevent fever. I should like to hear the experience of some of the gentlemen in these cases. Notwithstanding my greatest care in washing out the sac and inserting a double drainage tube, I have had septic fever. All my patients have recovered, but I look for fever in such cases for about a week or ten days, and if anyone knows how to drain these cases and not have fever, I should like them to tell me.

Dr. H. P. Jack, Canisteo, N. Y.: I do not believe the members of this Section, at least those with whom I have talked, know of the benefits to be derived by following Dr. Wetherill's technic. For the past five years in an extensive consultation practice I have seen many patients with septic infection of the uterus, some of the cases being of longer standing than mentioned by Dr. Ill, some of the patients almost moribund, and yet I have seen them recover under the persistent use of this technic. I commend the method; it should not be withheld in streptococcic infection. The alcohol is absorbed as well as the streptococci and how much good is done we cannot say. I have seen patients in whom the chills persisted, and multiple abscesses had formed at the points of pressure, recover under this treatment carried out for three or four weeks. I have never been able to obtain any such results with anything but alcohol, and I hope we shall have a more general use of a measure which is of such value.

Dr. H. G. Wetherill, Denver: Many of us feel that there is a very limited field for vaginal operation for ectopic pregnancy. While that field is limited, it has special indications which must be met, and one of them is "drainage," so-called, but in my judgment that is one of the forms of "drainage" to which gauze is better adapted than a tube. It approaches more nearly a need for a tampon than for a drain. My own practice, when vaginal operation is done for ectopic pregnancy, is to evacuate and pick out the clots as well as possible

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and to tampon with a wad of gauze. If in my opinion this will not meet the indications, abdominal section is done. The opinion of Dr. Ill I should have a great deal of respect for, because he has doubtless had a large experience with the intrauterine douche with alcohol solutions in sepsis and I have no doubt he obtains good results by his method, but in my judgment he is entirely in error in saying that there is no cavity inside the pregnant uterus. In the ordinary case in which pregnancy has advanced beyond six or eight weeks, the uterus is flabby and soft and its walls do not fall together as in the unimpregnated uterus, but whether there is a cavity or not is unimportant. Packing gauze into the uterus and leaving the gauze as a dam and not as a drain, interferes very much with the return flow from the uterus and it makes necessary—what is not necessary with the tube alone—the removal and changing of the gauze at short intervals. This is a menace to the patient because of the risk of retrograde infection.

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FACTORS WHICH CONTRIBUTE TO A REDUCTION IN MORTALITY IN ABDOMINAL SURGERY

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In submitting this subject for discussion, I do not hope to offer anything new, but desire merely to present an outline, an approach to which has served to reduce my mortality and to improve my results in other respects.

In offering surgical relief in an individual instance, we should be prepared to give the following reasonable and adequate assurance:

First.—That the risk to life, as this particular operation is to be done, is not out of proportion to the gravity of the disease. What chiefly concerns a patient undergoing operation is the risk to which she is subjected by the given surgeon with the facilities at his command, and not the death rate from this particular operation as done by the masters of surgery. In surgery, as in every other sphere of human endeavor, the element of personal equation largely determines results—one operator will habitually have a low mortality, another will achieve an occasional brilliant result, while the work of still another will always be mediocre. The patient who submits to an abdominal operation stakes her life on the ability of the operator to command proper facilities and to do consistently high-grade work.

Second.—That if the patient recovers from operation, there should be no essential reason why she should not

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have the desired relief—i. e., that the patient should not be subjected to the risk of a grave operation if she can not be cured of the disease, as is the case in advanced cancer. It would be unwise, also, to remove a uterus for fibroid tumor, if coincident and grave cardiac, pulmonary or renal disease would almost certainly cause permanent invalidism, and if the depression incident to operation might easily prove fatal.

Third.—That the conditions under which operation is to be done should be such that no other combination of circumstances could offer less risk to life, or a greater degree of security against postoperative complications.

Fourth.—That in removing one type of pathology we may be able to avoid substituting another type which might readily entail greater discomfort and danger than that removed. A patient who exchanges a retroverted uterus for an incisional hernia or serious intestinal adhesions can scarcely be said to have profited by the exchange. Such unfortunate results will undoubtedly be encountered occasionally by the most careful, skilful, earnest and successful surgeons. If such occurrences are rare, it may be wise for a patient to take the slight risk —but if in individual hands they occur with marked regularity the risk under such conditions is manifestly out of proportion to the benefit which may be reasonably expected.

Fifth.—That no other less onorous kind of treatment could effect the desired result in a more satisfactory way. For example, salpingitis and pelvic peritonitis often may be completely cured by a relatively short period of rest and medical treatment. Precipitate removal of diseased organs under such conditions would be manifestly unwise. It often happens that a well-fitting pessary completely relieves the discomfort due to uterine displacements; on the other hand, one often finds the perineum so badly damaged that no type of pessary can be retained. Under these conditions safe surgical correction is desirable.

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Sixth.—That the benefit to be derived from operation should reasonably be expected to compensate the patient fully for the risk to life, discomfort, loss of time, inconvenience, degree and duration of disability, and the cost of operation and still leave a decided balance of benefit to the patient's credit. The simplicity of the procedure and the success of the operator in the surroundings and under the conditions which exist should be such as to afford adequate warrant for the belief that a high degree of success will attend this particular operation on this particular patient.

Just in proportion as a surgeon is accurate in these estimates will his judgment be good, his counsel wise, and his results satisfactory.

I am fully aware that such restrictions imply a degree of skill and judgment that it is difficult to acquire. Yet the moral law and statutes confer on us broad privileges in handling human lives provided we recognize and respect the sacred trust such privileges entail. If we respect those laws we must realize that many factors contribute to a high percentage of recovery with ideal convalescence. Chief among them are a due appreciation of the functional value of anatomic structures, a comprehensive knowledge of the principles of pathology, the recognition and correct interpretation of gross pathologic lesions in the living subject, an intimate knowledge of the habits and accidents common to the structures with which we come in contact, a correct estimate of the patient's reserve strength, a wise choice of time and type of operation, a rigid aseptic technic, a considerable degree of manipulative dexterity and such *esprit de corps* among one's group of coworkers as will permit of operative speed and precision.

It is clear that to accomplish these aims necessitates a fortunate combination of time, adequate facilities, proper training, special aptitude, and assiduous application. Yet they are the requisites of uniform success and

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as such constitute the most important factors in the prophylaxis of postoperative morbidity and in the reduction of mortalty.

A comprehensive knowledge of the fundamental principles of pathology is essential to a correct interpretation of a given morbid process; to a forecast of its further course; and to a fair estimate of its present and future effect on the patient in question.

ACCURATE KNOWLEDGE OF THE NATURE, EXTENT AND TREND OF DISEASE

While it is practically impossible to make an exact diagnosis in every case before opening the abdomen, the careful and well-trained surgeon should be sure of the intra-abdominal condition in from 90 to 95 per cent. of cases. In estimating the needs of the individual patient it is not sufficient merely to know the nature of the disease for which relief is sought. One should know as well the influence it is having on the host, and also the extent to which it is modified by other pathologic processes affecting the individual. Should there be no other associated disease, it is still necessary to have exact knowledge regarding the lesion under consideration. The several stages through which the pathologic process passes, and the varying influence it exerts, make such knowledge essential to a wise handling of the disease.

Every type of pathologic process affecting the pelvic organs affords striking and frequent examples of the foregoing propositions. For instance, one's conception of early carcinoma of the fundus of the uterus which has scarcely invaded the muscular wall is entirely different from that of advanced adenocarcinoma of the cervix which quickly invades the parametrium and gives distant metastatic involvement. The treatment based on this conception differs quite as widely. Immediate hysterectomy in the first instance may be accomplished with little risk and is exceedingly likely to yield a radical cure. In our present state of knowledge one could hardly excuse a hysterectomy for advanced adenocarcinoma

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of the cervix and surrounding structures which would be attended by great risk to life and scarcely a possibility of even temporary relief.

One familiar with the progress and clinical aspect of varying types of uterine fibroids should reasonably expect to forecast the future course of events in an individual instance with the same degree of precision that the astute clinician anticipates complications in the course of pneumonia, diabetes, nephritis, arteriosclerosis, etc. For instance, if a patient of 37 or over has a growing interstitial or submucous fibroid, and for a year or more has lost an increasing quantity of blood, it is not necessary to permit the development of marked anemia with cardiac and vascular changes, nephritis, etc., before realizing that she represents a clinical type, tending inevitably to that end. On the other hand, a woman of like age or younger, with a small inoffensive subserous fibroid need not, at some risk, forfeit her chance of becoming a mother, by unnecessary haste in operation. A mere reference to such contrast of cases might seem out of place in this presence, and yet in my experience fully 40 per cent. of fibroids that have come to operation have shown some form of degeneration of the tumor, or serious cardiac, vascular or nephritic changes. Manifestly the time of election for operation comes before there is such debility as to retard convalescence.

The need for precise and comprehensive diagnosis is especially great in dealing with inflammatory affections of the genital tract—thus the outcome and hence the treatment may differ widely in such pathologic processes as true cellulitis with dense inflammatory exudate, on the one hand, and salpingitis, on the other. In each of these affections the best course to pursue may vary materially with the duration, extent and trend of the disease.

Equally wide differences in clinical aspects and treatment may arise in the course of such affections as ovarian cysts and tubal pregnancy.

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EXACT DETERMINATION OF THE PATIENT'S RESERVE STRENGTH

The most frequent, the most perplexing and at the same time the most important decision the surgeon is called on to make relates to the margin of reserve strength possessed by the individual patient and the extent to which that margin will be encroached on by the method of obtaining relief. He must recognize the fact that a definite percentage of reserve strength is essential to the absolute needs of existence. It is evident that the energy that may with safety be dissipated by operation must come from this margin of reserve strength above the absolute needs of existence. The risk of operation increases just in proportion as this margin is encroached on. It is important that surgeons should analyze the composite picture of reserve strength and strive diligently to reduce it to an exact analysis. It is clear that this margin depends on the functional value of all the vital organs, including the musculature.

It is usually possible to determine the functional value of each of these several structures by well-known clinical methods. To eliminate the element of chance it is essential that such clinical methods should be habitually and systematically employed. There would seem to be, however, a small percentage of cases in which the available tests are inadequate, notably those in which sudden death occurs in the course of what appears to be a perfectly normal convalescence, with or without evident fatal embolism; postoperative nephritis occurring in what appeared to be previously healthy kidneys; and rare evidences of death due to acidosis, the urine having previously been free from sugar, diacetic acid, and other abnormal constituents.

JUDICIOUS ADAPTATION OF TIME AND TYPE OF OPERATION TO INDIVIDUAL NEEDS

The wise adaptation of the time and type of operation to individual needs is essential to uniform success. It

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demands prompt decision and constitutes the severest test to which a surgeon's judgment is put.

It is not always easy to refrain from surgical intervention when a patient lies critically ill and is apparently growing worse from an intra-abdominal affection which will clearly demand operation at some stage of its existence. Yet if we except accidents and injuries to hollow viscera—strangulated hernia, perforation, etc. —it seems clear to me that an increasing percentage of so-called emergency work can be reduced to the safer planes of incomplete and elective surgery. In all surgery there is scarcely a more hazardous procedure than the removal of a large universally adherent, infected ovarian cyst at the height of an acute and exhausting illness. It often happens, however, that evacuation renders subsequent removal simple and safe. At times such an emergency as torsion of the pedicle of an ovarian cyst is rendered more serious by a severe complicating nephritis. To withhold surgical relief may seem a hazardous procedure and yet it is often surprising to see the marked improvement which follows delay and restored renal activity. It occasionally happens that the completion of an operation would probably prove fatal, whereas temporary failure may later be followed by safe operation.

When pronounced anemia and cardiac and renal complications accompany uterine fibroids the most gratifying results are often attendant on a few weeks of preliminary treatment. A number of patients who had for some months been going progressively down until they were almost exhausted have improved sufficiently to permit of safe hysterectomy and speedy convalescence, whereas more precipitate operation might readily have proved fatal.

My conviction daily grows more firm that by converting acute inflammatory affections of pelvic structures into aseptic lesions the need for operation and the post-operative morbidity and mortality may be greatly reduced. This conviction is based on an increasing num-

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ber of complete recoveries without operation and a series of 475 consecutive abdominal sections for inflammatory lesions of tubal origin with only four deaths.

When operation is done while inflammatory exudate still infiltrates intestinal walls, injury with subsequent fecal fistula, adhesions and intestinal obstruction, are far more common than when internal sterilization of pus (tubes) is practiced. In the series of cases just referred to (475 sections for quiescent inflammatory products) there have been only two cases of partial intestinal obstruction. One of these was subsequently relieved by operation. The other did not require it. These four complications occurred in cases in which operation was done relatively soon after the acute attack had subsided—that is, just as the last of the exudate was being absorbed. During the period in which these sections were being done for inflammatory lesions something more than a thousand sections were done for other types of pathology without a single fecal fistula, and, so far as I know, with only one case of partial intestinal obstruction, which occurred two years later.

A GROUP OF COMPETENT COWORKERS

I consider the proper organization of a surgical service an important factor in the reduction of mortality. The method which seems entirely satisfactory in my service at the Allegheny General Hospital consists in dividing the work into several departments and having a corps of competent and continuous workers in each. The corps of workers consists of:

1. A thoroughly reliable and efficient first assistant is, I believe, essential to quick, precise work and uniform success. Dr. S. A. Chalfant, who was anesthetist for a considerable period of time, has occupied the position of first assistant for a number of years.

2. A skilled anesthetist, on salary, who, in addition to giving all anesthetics, is responsible for a typewritten record, embodying all details regarding diagnosis, opera-

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tion, pathologic lesions found at operation and a description of specimens removed. It is his further duty to keep tabulated records of postoperative facts in any way due to the administration of the anesthetic.

3. A pathologic department consisting of an expert pathologist cooperating with the pathologist of the institution and having a competent salaried assistant. Among other things, it is customary to have routine examinations of blood at stated intervals before and after operation, and at other times if occasion arises; to examine the urine before operation and each 24 hours thereafter for two or three days, or as long as any abnormal constituents are found. The routine urinalysis embraces among other things a quantitative estimate of the acetone bodies both before and after operation; systematic bacteriologic investigations and histologic examinations of specimens and discharges are made.

4. The Nursing Corps.—Much depends on the proper organization of one's corps of nurses. A group of intelligent, earnest, systematic, diligent nurses, who take a deep personal interest in promoting the comfort, security and welfare of each patient, contributes much to the efficiency of one's work. The arrangement we have had at the Allegheny General Hospital has proved satisfactory in method and personnel. (a) There are efficient graduate head nurses in charge of the private and ward floors. They have the usual group of undergraduates. (b) An unusually competent graduate nurse has for a number of years been in charge of the operating room and of the preparation of all dressings used therein. She also prepares the field of operation in clean cases. She has two undergraduate assistants. (3) A plan which I can not commend too highly is the employment of a continuous group of postoperative nurses chosen because of especial aptitude and fitness for this particular type of work. Each patient subjected to abdominal section should be under the care of such a competent graduate day and night nurse for the first 48

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hours, or as much longer as the patient's condition may demand. They add much to the comfort, and, by being skilled and alert, to the safety of patients. Private patients gladly pay for this service—the hospital supplies it to charity patients.

MINIMUM AMOUNT OF ANESTHETIC

Undoubtedly one of the most important advances in major surgery during the last century was the introduction of anesthetics. During the last decade one of the most important advances has been the uniform and progressive tendency to reduce the quantity of anesthetic. This has resulted from a better understanding of the frequency, nature and extent of the deleterious effects they cause. It has been accomplished by the employment of skilled anesthetists, by the adoption of better methods of administration and by such improvement of team work in operative technic as reduces the duration of operation.

While fully recognizing the extent of our indebtedness for anesthetics, and to those who introduced them, we must not lose sight of the fact that, while doing immense good, anesthetics usually cause distinctly harmful results. These results are expressed in a definite clinical picture which is always present but in varying degrees. One almost invariably sees marked muscular depression and interference with glandular secretion as evidenced by parched lips, intense thirst, usually nausea and vomiting, and a reduced quantity of urine.

When this disturbance is more marked the air passages may become affected, the circulatory system depressed, metabolic disturbances occur, and hepatic and renal functions may be markedly or even seriously vitiated.

The more thoroughly one investigates these subjects by careful observation of symptoms and systematic preoperative and postoperative analysis of secretions, the more fully does one realize that the anesthetic is per-

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haps the most important factor in determining operative mortality. The truth of this proposition has repeatedly been demonstrated to my entire satisfaction by contrasting the postoperative condition of two classes of patients: The one class embraces such operations as appendectomy, cholelithiasis, hysterectomy for fibroid, etc., on good subjects under ether anesthesia. The other class includes a number of patients operated on for gallstones, large adherent ovarian cysts, appendicitis, etc., who were also the subjects of such grave cardiac, renal or pulmonary disease as positively contraindicated the use of a general anesthetic. The observation has been so common as to be almost universal, that in the grave cases without anesthesia the patients were some hours later, in much better condition than the patients in the simpler cases to whom ether was given, and that convalescence was almost uniformly more smooth and satisfactory. I would emphasize the fact that this striking difference was in favor of the patients who would almost certainly have died had a general anesthetic been administered.

The method we have found most satisfactory has been the continuous services of a skilled and salaried anesthetist who uses the open or drop method, with the coincident administration of oxygen, using a soft catheter introduced through the nose. The use of oxygen in this way has, among other things, almost done away with nausea and vomiting.

I believe that a full appreciation of the possible harm that might result from the administration of anesthetics, and a careful study of the circulatory, respiratory and urinary tracts before operation, has contributed no little to the maintenance of a low operative mortality in my service. It has also done much to reduce the frequency and severity of such postoperative complications as are attributable to this cause. Pneumonia and bronchitis are exceedingly rare; shock and other circulatory disturbances are almost never seen, and urinary complica-

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tions are much less frequent and serious than formerly. There have been only 13 deaths (1.86 per cent. mortality) in the last 700 consecutive laparotomies.

RIGID ASEPTIC TECHNIC

A rigid aseptic technic is unquestionably the foundation on which all modern surgery rests. Without it there can be no uniform success. Without it the certainty, nature and extent of postoperative complications is such as to render elective surgery rarely, if ever, justifiable. The development of a rigid aseptic technic demands that the surgeon, his assistants and all others who come in contact with the field of operation during the period of preparation, operation or postoperative care, shall absolutely avoid contact with any wound, dressing, receptacle, or other structure or article which is not surgically clean. This implies the use of sterile rubber gloves in all physical examinations of patients, presumably free from open foci of infection. It implies even more rigid care in examinations made in the presence of discharges from open wounds. Uniform aseptic success demands that such precautions be taken every day in the year; so that the most important instruments concerned in operation, the hands and their covering, shall remain as nearly aseptic as possible. The hands having been kept continuously clean, the risk of infection is further reduced by the use of well-fitting rubber gloves of good fiber. These principles apply with equal force to the operator, his assistants, the nurses in the operating room and those who have the care of the field of operation. Such a rigid aseptic technic forces on us recognition of the undoubted fact that hospitals are clearing houses for all types of infection. With rigid technic, proper segregation of patients, and such division of labor as precludes the intermingling of caretakers of septic and clean patients, it is easily possible to do elective work with uniform aseptic results. We should never lose sight of the fact, however, that when

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the least relaxation occurs the conditions are analogous to those which exist when a powder mill and a match factory are operating under a single roof.

SPEED WITH PRECISION

If a surgeon is called on to operate at a distance, in a definite and considerable percentage of cases, he will lack essential facts which should guide him in deciding for or against operation, the type of procedure to be employed, and the time of election and the conditions under which it should be done. If he operates under such conditions, the death rate will be unnecessarily high. If he declines to operate, an embarrassing situation arises.

I can not too strongly commend the wisdom of operating habitually in one's accustomed surroundings. By doing so and exercising constant effort to develop systematic methods, it becomes possible to have the duties of one's coworkers proceed with clockwork precision.

With such a well-organized corps of workers, the division of labor may reach such a degree of efficiency that the operator may concentrate his entire attention on his individual work—arriving with unnecessary interruption at prompt decision regarding the fate and function of structures, the type of operation best suited to individual needs, and essential methods of technic.

By such an arrangement, one will more uniformly do the operation best suited to individual needs; good team work, celerity and precision reduce the time required for operation, the quantity of anesthetic employed and the possibility of such accidents as slipping ligatures, losing pads, peritonitis, infected pedicles, stitch abscesses, etc. In one's accustomed surroundings, where a definite, systematic and careful technic is employed, it is rarely necessary to improvise. He is a poor surgeon who can not improvise if an emergency demands it. He is a poorer one who habitually or frequently allows himself to be placed in such a position that he must improvise. The act of improvising is evidence that an operator is

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substituting an inferior method of procedure for one he would prefer to employ in the individual case. While untoward results may rarely follow, ample room exists for the element of chance to enter.

The evolution of systematic methods and technic employed in operating rooms will necessarily vary according to individual requirements. The simple technic which has proved satisfactory in my operating room at the Allegheny General Hospital is briefly as follows:

In order to reduce the chance of transmitting infection to a minimum only three persons are supposed to have clean hands—the operator, the first assistant, and interne; they scrub their hands with soap and running water for twenty minutes, and then use such chemical antiseptics as will not injure the skin. Solutions of potassium permanganate, oxalic acid, bichlorid of mercury and, finally, alcohol being the sequence preferred, but if either of these solutions is irritating to the skin it is omitted.

All instruments and dressings used during operation are taken directly from the sterilizer by the first assistant. The arrangement of dressings and of instruments in trays and on tables is always exactly the same, thus enabling any one connected with the operation to find a desired article without a moment of hesitation.

In order to avoid unnecessary handling and consequently arousing of patients, they are anesthetized on the operating table, which is then rolled into the operating room.

While the first assistant is arranging instruments and dressings, the head nurse has the patient placed in proper position so that the interne proceeds at once to cleanse the field of operation. While the operator adjusts protecting sterile cloths, the first assistant verifies the count of abdominal pads and the head nurse places the instrument and dressing tables in their respective places.

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The instrument table is placed within reach of the operator; as the instruments always occupy exactly the same position in the several trays it is easy to pick up any desired instrument without even turning the head. The first assistant having verified the number of pads available for use, must account at the end of operation for the number, which must always be a multiple of five. In order to avoid error, as soiled pads are discarded, the head nurse has one of her assistants collect these pads and pin them together in sets of five. These sets are then arranged in definite order so that with the greatest economy of time the head nurse may at any moment give the correct count of discarded pads. To this number the first assistant adds those in his keeping. If the aggregate is not a multiple of five, one or more pads must be found within the abdomen or elsewhere. So far as we know, a pad has never been left within the abdominal cavity, though without such a definite system I am confident such an accident would probably have happened.

The instruments, needles and suture materials are in the hands of the interne. It is our desire to simplify methods so far as possible, so only four types of needles are used. Each needle has its definite purpose. It always carries its definite kind of sutures—the suture material employed is limited to silkworm gut, celluloid linen No. 1, and the finest catgut, that will give a fair degree of tensile strength. We usually employ commercial catgut which is contained in hermetic glass tubes and is supposed to be sterile. Before using, however, the tubes are boiled for half an hour on two successive days.

It is my belief that the head nurse can accomplish most by being free to adjust the patient, to arrange instrument and dressing tables, irrigating stands, solutions, intravenous sets, hypodermics, if needed, supervise the counting of pads, send specimens to the laboratory for immediate frozen section, etc. We accordingly prefer that she should not have sterile hands.

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The head nurse and her two assistants make all dressings used in the operating room—and see that a supply of all appliances used is constantly at hand.

It is our desire to make the postoperative treatment of patients as simple as possible, especially to minimize, so far as possible, the petty annoyances which disturb patients unnecessarily, etc. They are kept as quiet as possible, they are rarely catheterized—ice is usually applied to the abdomen—continuous enteroclysis, normal salt solution, Murphy method often serves a valuable purpose. The patient's position may be about what she wishes, unless there is some especial reason to avoid moving, such, for instance, as the use of drainage.

CONCLUSIONS

In conclusion, I believe that an accurate knowledge of the nature, extent and trend of disease, and exact determination of the patient's margin of reserve strength; a judicious adaptation of the time and type of operation to individual needs; a group of competent operative coworkers; a minimum amount of anesthetic; a rigid aseptic technic; and speed with precision, are factors which will yield a low mortality and highly satisfactory operative results.

ABSTRACT OF DISCUSSION

Dr. C. A. L. Reed, Cincinnati: Operative celerity consistent with the safety and precision of operation, with reference not only to minimizing the time but the amount of the anesthesia, is a matter that cannot be emphasized too strongly. I was invited for three o'clock one afternoon some time ago to witness an operation that was done in the patient's house, where it ought not to have been done. I arrived nearly half an hour late, expecting that the hysterectomy would have been concluded. I not only was not too late, but I had the opportunity of holding a coal oil lamp for over an hour after nightfall until the operator got through with his work. It is needless to say that the patient died. Recently a patient was kept under anesthesia for a simple perineorrhaphy for 2½ hours. Operations of that kind are being done with a frequency that is alarming, and the sooner this Association states its disapproval of this slovenly method the better. I have

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been in operating theaters, with good operators in charge, in which I have seen the surgeon, instead of paying strict attention to his business, engage in conversation with those about him, while the patient was being kept under an anesthetic, thus unnecessarily and dangerously prolonging the period of operation. I recall with pleasure that celerity was one of the great points constantly emphasized and exemplified by the late Lawson Tait, than whom no more successful operator ever lived. Those who had the privilege of seeing him operate will recall with what promptness he did his operations, with what general precision they were done, and all will testify to the high grade of his results. The point to which he constantly called attention was the importance of minimizing the anesthesia with reference to sparing the patients from metabolic difficulties due to taking too much anesthetic. The time has arrived to proclaim, and I think the protest should go forward in no uncertain terms, that that surgeon who consumes an unnecessary amount of time in the performance of the operation subjects his patient to an unnecessary danger. Therefore, when a surgeon begins an operation, let him begin and pay attention to his business and keep at it until the work is safely done. And this reminds me that there are other phases of the question, either actually raised or suggested by Dr. Simpson's paper—and that is as to the question of surgical competency. This is an issue that we have been dodging in one way or another for a long time. It is one that nobody likes to take up. But we all know that a lot of surgery is being done by a lot of operators who are not qualified for the work. I shudder when I think of the possible unnecessary mortality due to this cause. In one of the states, Colorado, I believe, a bill was introduced last year that was intended to put a curb on this abuse by establishing a supplementary state license on surgery. I don't know what came of the bill, but I do know that the mere fact that such a bill was framed shows that the public is taking cognizance of the fact that general medical qualification does not always imply special surgical qualification. The fact is that surgical work is being cheapened by average amphitheater exhibitions. There is too much of this thing of going for a day or a week "to see the Mayos" or "to see Murphy," or "to see Richardson," or "to see Matas," and then coming back a full-fledged surgeon. The postgraduate schools with their semi-diploma certificates are far from being without responsibility for this situation. The fact is that the "smatter-courses" ought to be suppressed. Let us get to the point of thoroughness, to the point of apprenticeship, to the point of broad fundamental culture, to the point of careful manual training, and away from the irresponsible promiscuity that now too much characterizes the surgery of this country.

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Dr. J. H. Carstens, Detroit: The patient should be carried into the operating room and anesthetized without having time to think of the operation. The shock and dread kill many patients. Another point that I wish to make is that slow operating is bad practice. No one can operate with gloves so quickly as without, so I operate with my bare hands. I see men do all kinds of operations with gloves on. These often tear during the operation and naturally will infect the patient. In order to do good rapid surgery one must have asepsis and absolutely clean hands all the time, and that means that the surgeon must not at any time put his fingers into a dirty place. If he ever gets his hands contaminated it will take many weeks to get them clean, no matter what the antiseptic or what amount of scrubbing he employs. If I make a mistake in diagnosis and find that I have a pus case I quickly put on gloves.

Dr. H. J. Boldt, New York City: Dr. Simpson said that operators should be careful to make an exact diagnosis in cases in which they intend to operate. That is very nice and while an exact diagnosis should be made in 95 per cent. we must not put the burden on the operator so much as the teachers who are connected with schools sending out men who are in time to be operators. A great many men who enter the field of surgery take a postgraduate course of six weeks or two months and go out, considering themselves specialists in certain lines of work. It is not possible that any one can learn a proper technic in so short a time. Pupils in their senior year should be taught how to make diagnoses. The method of treatment will come of its own accord if a correct diagnosis is made.

Dr. C. S. Bacon, Chicago: It seems to me pertinent to call attention to the proposition that a special license be required for surgical operators. Last year such a measure was presented to the legislature of Colorado, but it was not endorsed by the profession. It, however, shows the trend of the times and undoubtedly there will be a great deal more proposals of the same kind in the future. The importance of proper training in diagnosis and especially in surgical technic is admitted by all. Does every one who receives a license to practice possess such training? We all know that he does not and it is manifestly not right that every one should have the license to perform all sorts of operations.

Dr. F. F. Lawrence, Columbus: One contributory factor in shock which has not been mentioned is unnecessary traumatism. I care not whether it be by stuffing the abdomen full of gauze or by bruising the tissues with retractors. Every surgeon should teach that such unnecessary trauma is unsurgical. What useful purpose can a lot of gauze stuffed into the abdomen serve? None. There is seldom any necessity for putting a metal retractor in the wound. If there is a bleeding

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vessel down in the wound or in the pelvis or back in the mesentery it may be necessary for a moment only. When we teach that we must prevent every unnecessary trauma we will save our patients shock and forestall one of the elements of infection. There can not be infection in normal tissue.

Another thing: Operations should be done in a dry field. Sterilizing should be done the night before, a double sterilization; germs grow only in a moist soil. Ligatures should not be tied too tight. Strangulated tissue is dangerous and no matter how slight the strangulation may be it causes shock.

Dr. Robert T. Morris, New York City: We are now on the verge of a fourth era of surgery. The first era was heroic. The next, anatomic. The third, now prevailing over the world, is the pathologic, in which we expect by mechanical measures to remove the causes and products of infection. The fourth era, on which we are just now entering, is the physiologic, which includes the idea of conserving all the natural resistance of the patient and allowing him to do what we have tried to do in a crude way mechanically. If we are to allow the patient to do this by conserving his self-resistance, we are to accomplish it by avoiding all the causes which shock the machine which is making phagocytes and opsonins. The patient has no other business. His business immediately after operation is manufacturing and if we interfere with the work of this machinery by long-continued operation, by long and unnecessary technic, by performing taxidermy on a patient with gauze, we prevent that patient from manufacturing his phagocytes and opsonins. An important point among those brought out by Dr. Simpson is asepsis. If I were anchoring a floating spleen I would wear a mouth mask, cap, and rubber gloves. If I were operating on a case of appendicitis with abscess, I would not wear a mouth mask, or a cap, or rubber gloves, and it would make no difference whether I washed my hands after the operation or before. If pus were spread on the normal peritoneum in the course of the operation I would leave it there. I would get in and get out. I would leave the patient with a normal resistance which would care for that pus so much better than I could care for it that his chances for recovery would be very much increased. In anchoring the spleen we might take twenty minutes for the operation; but for the pus case with appendicitis, we should not make the operation longer than five minutes if possible.

Dr. Horace G. Wetherill, Denver: The established immunity which occurs in certain acute cases is important and frequently such patients should be tided over the acute stage. The general tendency of the last few years has been to do this with certain peritoneal infections, notably with those from appendicitis. Far too many operations have been done for acute pelvic infections and often with extremely bad results. The bill which Dr. Bacon referred to for the control of

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surgical operations was presented in the legislature of the state of Colorado. It was not approved by the local medical profession. As president of the Colorado State Medical Society I presented a plan which, for us, seems much better. In the west the hospital situation is different from that of the east. We have a hospital staff; but the work in the hospital is not limited to the staff. Any physician may take his patients into the hospital and do as he pleases. My proposal was that each of the hospitals in our cities appoint a representative, these representatives to form a body to be known as a sort of hospital clearing house association representing all the hospitals in the community. Among other duties of this body every one wishing to take patients to the hospital must make application to this clearing house association. He must present his credentials, tell with whom he has worked, what his work has been, and in a broad way what his qualifications are. On such application made to this board his practice in the hospitals must depend. In many communities that is a plan which would meet this difficulty.

Dr. John A. McGlinn, Philadelphia: I want to emphasize Dr. Boldt's statement in reference to diagnosis, and to urge the necessity of teaching and training students to be diagnosticians rather than operators. I feel that clinics made up of major operations are useless. The students can see but little of the technic, yet it gives them confidence to attempt work for which they are not trained. The time could be much better devoted to practical work in diagnosis. While I do not minimize the necessity of speed in operations I feel that completeness is a far more important factor. Recently I operated on a patient with double pyosalpinx several weeks after a general surgeon had removed the appendix. Within the past year a colleague operated on a patient with ruptured tubal pregnancy ten days after a very able surgeon had removed the appendix. These two cases are sufficient I think to prove the necessity of sacrificing speed to thoroughness in our work. The matter of anesthesia is important. I do not believe that it is advisable to allow the resident physician or an untrained man to give an anesthetic. I have always looked on the giving of an anesthetic as important as the operation itself. For this reason I have always employed a trained anesthetist. With reference to asepsis, I feel that the fewer assistants one has the better will be his results in an aseptic field. I use but one assistant for all operations and he has very little to do. He is simply used as an extra pair of hands to hold some instrument such as a retractor. One can train himself to work rapidly with few assistants, depending on himself for almost everything.

Dr. F. F. Simpson, Pittsburg, Pa.: My object in bringing this subject before the Section was to get just what we have had, a definite expression of opinion by operators. Relative to

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some of the factors concerned in the reduction of mortality I would say that the synopsis that I have read is merely an abstract of my paper which will be published in full and a good many of the points brought out by the discussion have been more fully dealt with than the abstract indicates.

In regard to the reduction of mortality as related to the anesthetic, the opinion I wished to convey was that a study of the deaths during the last four or five years would show that probably one-third of the deaths could be attributed directly to the anesthetic, that is, to the effect of the anesthesia in disturbing metabolism, and its influence on the kidneys and on the liver. The more fully we study the subject of acetone bodies and the effects of metabolic disturbance the more do I believe that the anesthetic and its effect on metabolism will probably be found to be the cause of a high percentage of the deaths that actually occur.

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SOME MINOR GYNECOLOGIC MATTERS OFTEN OVERLOOKED

I. S. STONE, M.D.
WASHINGTON, D. C.

In routine practice we may fail to appreciate certain rare or obscure diseases which are very annoying to our patients, although not dangerous to life. We find a number of cervical erosions, classified as infectious, which are due to other causes. There are numerous infections of glands of the genital tract which are not understood, and which are not successfully treated because the seat of the infection is not exposed and thoroughly sterilized. Many patients have numerous deep vulvar glands, especially about the vestibule, which may become veritable nests for gonococci or other microbes and will perpetuate an infectious discharge indefinitely unless opened widely and sterilized by iodin or some equally good application. Skene's glands in the urethra are known to harbor infectious organisms and to cause a persistent urethritis. This disease requires surgical treatment if a cure is obtained. The glands must be opened up, thoroughly exposed and treated. My purpose at present is to direct attention to certain nerve changes about the genital tract.

NEURITIS AND HYPERESTHESIA OF THE VULVA AND VAGINA

This is a frequent and often unsuspected cause of annoying symptoms. One of the commonest mistakes made by physicians who treat gynecologic patients is to call every sensitive surface an inflammation. Careful

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discrimination will enable one to detect certain nerve alterations and to see the difference between them and vaginitis or vulvitis, due to infection or persistent irritation of any kind.

These nerve changes are often seen in a consulting practice. The patient has had fairly good, and perhaps rather active, treatment for infectious disease and has not obtained relief. In fact, nearly every patient coming under observation has been subjected to much local treatment, all of which has probably done harm unless such treatment finally results in a diagnosis.

SYMPTOMS

The patient is usually a neurasthenic or a neurotic. She is usually suffering from associated disease, which is often due to impaired function rather than to organic mischief. She has a leucorrhea due to more or less endocervicitis, and believes that the discharge causes the painful condition of the vagina. The parts are extremely tender, are often red, and occasionally swollen. Micturition is generally painful in those cases with red and swollen mucosa. The disease is not confined to any special class. We encounter it in virgins relatively as often as in married women. The patient is often told by some physician that she has "ulceration" of some portion of the vaginal mucosa. A slight erosion of the cervix becomes the *point de résistance* of much medical treatment, and in a recent case the patient told me that she had "three different ulcers of the cervix cured by treatment, only to have them return as before."

It is a common practice of many physicians to rely strictly on local treatment for a cure of this disease, because they fail to see the real cause back of the local manifestation. Obviously, all applications of tampons, iodin, ichthyol, boric acid, and glycerin fail unless they benefit by entertaining the patient while time and improved general health bring about a cure. It is in this class that we see the evil result of suggestion. Many of these patients are acutely sensitive to wrong impres-

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sions and they are easily and often inadvertently led to think that a slight displacement of the uterus or an enlarged ovary, or possibly some slight intestinal irritation, if treated perhaps surgically, can be cured. It is well known that the uterus has often been removed because the supposed irritating discharge could not be otherwise cured. Of course, in certain cases the neuritis may not easily be relieved or the symptoms even palliated. I have seen several cases associated with urethral caruncle, and I am inclined to believe the pain of a caruncle is always due to an associated neuritis. We have all seen caruncles removed without relief to the patient, and unless they are associated with cystitis the failure is generally due to nerve changes.

DIAGNOSIS

If methods of examination were more exact we would find fewer cases of acute infectious disease of the vulva and vagina and relatively numerous cases of neuritis or hyperesthesia. Naturally, we resort to well-known methods of treatment rather than make the effort to establish a correct diagnosis based on careful investigation. Such empirical practice will perhaps long retain a hold on our favorable consideration, although we always have at hand perfectly satisfactory, even if slower, methods of reaching a diagnosis and consequently a proper indication of treatment. We fail to see any improvement in the teaching or treatment of the minor gynecologic cases since the days of Sims, Emmet and Thomas, and hence surgery has become far more prominent in this specialty than before, and I am confident more than is desirable or necessary.

It is impossible for every one at first to distinguish between cases of hyperesthesia and those of neuritis, but it is comparatively easy for those accustomed to make such distinctions in other portions of the body. Without resort to electrical or other scientific measures, the usual observation and care which is exercised by any physician

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who is on the alert for these cases will enable him to detect the condition under discussion. In any event, a diagnosis between hyperesthesia and neuritis is not absolutely necessary. The precise portion of the vulva or vagina which may be the seat of the disease is altogether uncertain. I find that the sensitive area in by far the greater number of cases is about the vestibule and introitus. Recently a case of neuritis was seen with dark discoloration of labia around the glands of Bartholin, due to repeated cauterizations, probably with silver nitrate. Occasionally I find a sensitive spot or area on or near the cervix, as in a case recently seen in a pregnant woman. This latter was, however, associated with marked neurotic symptoms which closely resembled inflammatory mischief.

ILLUSTRATIVE CASES

CASE 1.—Patient referred by Dr. C.

Miss X., aged 35, had been treated for infectious endometritis by curettement and intrauterine cauterization, without relief. She had swelling and edema of the vulva with each menstruation, causing great distress. When first seen there was redness; slight swelling and some erosion of the vulva with painful micturition and occasional itching. The urine was nearly normal and contained no sugar. She had been examined for eczema by a competent dermatologist who recognized the unusual features of the case. This patient had associated neuritis and endometritis. I made the diagnosis and treatment was carried on by her family physician, who reports a gradual improvement and nearly perfect restoration to health.

CASE 2.—Patient referred by Dr. W.

Miss Z., a thin, nervous virgin, aged 27, with hymen intact, had been told that she had "ulcers" on the vulva. She had a very slight leucorrhea, but I failed to discover the ulcers or even redness about the vulva or vagina. The uterus was small and retroverted, otherwise all the organs were normal. Her complaint of painful and sensitive vulva and vagina led me to go slowly in reaching a diagnosis. Examination of the discharge was negative, there being no possible infection of the vagina. She passed out of my hands and an abdominal operation was performed for a slight displacement of the small

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uterus, with the result that she believes herself benefited, although the time has been too short for definite results. Of course, the lesions found at the operation did not explain the symptoms and the girl will finally recover when her nervous disease disappears either by good fortune or by proper treatment.

TREATMENT

The suggestions already made indicate the line of treatment to be adopted. The diagnosis made, the treatment becomes a matter of simple attention to the general health of the patient. In irritable and sensitive vaginæ we should avoid all irritating applications and should use either drying powders or emollients. It should be remembered that any fluid may cause burning and smarting if a neuritis be present. The indication is to protect the tender surfaces so far as lies in our power.

Stoneleigh Court.

ABSTRACT OF DISCUSSION

Dr. Robert Morris, New York City: The colon bacillus is not infrequently an infecting agent in the vagina and uterus. At present I am having some investigations made in a number of cases in which the discharge from the endometrium is secretional in character. This discharge forms a culture medium for the colon bacillus, and the colon bacillus may extend its field from the vagina to even the peritoneum. Another point which I wish to make is in connection with a minor gynecological disturbance that is commonly overlooked, and to which I have given a good deal of attention during the past two or three years—the effect, the remote effect, of eyestrain, particularly in school girls. Recently I had two cases; one patient had an acute anteflexion; one had retrodisplacement. In both cases there was obstinate obstruction of the bowel to such a degree that both patients were in great distress, and there was a question whether or not they would be obliged to give up their school work. In both cases I was able to eliminate all factors except the eyestrain. The patients were sent to an ophthalmologist and both were well in thirty days. I am having a great deal to say on the subject of eyestrain, but not so much as the men who are throwing the subject into disrepute. A great many ophthalmologists have seen the horizon of this subject enlarged so enormously that they are speaking from imagination rather than facts. Let us speak from facts. In a certain proportion of

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minor gynecologic cases, particularly in young people, eyestrain is the cause and can be discovered by the proper ophthalmologist—who is not easily found. The ophthalmologist usually makes an examination with reference to an ordinary refraction and his report relates to the sight. That has nothing to do with the case. Remote disturbances are to be sought by men competent to do this. I said to an ophthalmologist recently, who had examined the eyes of a patient in which eyestrain was, in my opinion, the cause of the disturbance: "Now, have you examined with reference to muscle imbalance?" "No," he said, "I have just examined with reference to sight; I will take this matter up." There was a case that had slipped past an absolutely competent man who had not taken up this subject with reference to gynecologic features. It is a matter which has been overlooked by most of us, but let us send cases in which eyestrain is possibly the cause to the proper ophthalmologists, and let him give us either negative or positive testimony.

Dr. Mary E. Dunning, Newburg, N. Y.: I believe that nerve strain has much to do with many local conditions seen in our patients. A case worthy of note is that of a woman of 38, whose menstrual function had always been accompanied with terrific headaches and vomiting. Examination showed nothing abnormal in the pelvis excepting extreme tenderness of the adnexa, and there was a spur which blocked completely the left nares. Two pelvic hydroelectric treatments were given and the spur removed. She has had no nerve disturbances, menstruation has been normal and she has been perfectly well since.

Dr. Angeline Martine, Utica, N. Y.: Dr. Morris' mention of the colon bacillus being a cause of irritation in certain cases, reminds me of a case in a young unmarried woman of undoubted good reputation who had an irritation resembling grossly a gonorrheal infection. I had the discharge carefully examined under the microscope, and found that it was due to an infection by the *Proteus vulgaris*. I have had a series of seven or eight such cases which I have reported. The infection is very intense. One of the cases seems to have been contracted by the use of the public toilet. The source of the other cases could not be traced. The infection so closely resembles gonorrhea that much care should be observed in the examination.

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FIBROMYOMAS OF THE UTERUS

WITH REPORT OF SEVEN HUNDRED CASES STUDIED STATISTICALLY AND PATHOLOGICALLY

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There has been of late years much discussion and debate about the life-history, dangers and treatment of uterine fibromyomas. The trend of these investigations has been to discredit the traditional or so-called conservative treatment of these tumors. Many facts have been brought out in regard to the dangers, and weighty arguments have been made in favor of their operative cure. The most important changes or complications which have been studied in connection with fibroid tumors is their association with malignant changes either in the tumor itself or in its host, the uterus.

This may have a very direct bearing on the treatment of these tumors, for if it can be proved that there is a large percentage of malignant changes in the growth or dependent on their presence in the uterus a weighty argument has been made in favor of their radical treatment and removal.

The other more grave complications and degenerations of fibroid tumors are those of hemorrhage and necrosis. These are of importance chiefly because of the danger of infection resulting from their existence in the tumor. It is of importance that the percentage of occurrence of these degenerations and the age at which they are likely to occur should be carefully studied, and it is also of importance that the percentage of occurrence should be reckoned at various ages in order to show whether with

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increasing age there is a disposition for these changes to occur more frequently in fibroid tumors; for if these grave changes of necrosis and cancer occur more frequently with increasing age and occur in a proportionate mortality greater than that of the mortality from operation for fibroid tumors, then the menopause does not bring relief from the trouble of fibroid tumors, but brings more grave dangers, and not a cure.

It has been the custom, since my paper of 1904 on the subject,[1] to collect all the known series and statistics of fibroid tumors and, combining them, to draw deductions from the composite series. This method of estimation of the complications and degenerations of fibromyomas is not without its fallacy. Many of these series, beginning with Martin in 1888, were reported at a time when complete microscopic examination was not made of all tumors, but only in selected cases. In this way many loopholes for error were opened and many complications and degenerations were overlooked. This is particularly true of the complications of cancer and sarcoma, as is shown by Winter's[2] two series. In his first series of 500 cases only the suspicious tumors were examined microscopically and sarcomatous degeneration was found in 3.2 per cent. In his second series of 253 cases in which sections were taken systematically from all tumors, sarcoma was found in 4.3 per cent. Winter believes that if myomas were examined systematically, sarcoma would be found in about 4 per cent. of all series.

The routine microscopic examination is not only of importance in regard to fibroid tumors themselves, but it is also of importance that the adjacent tissues removed at operation, such as ovaries, tubes and appendices, should be carefully examined. It is obvious that this was not the case in many of the series so frequently collected. Cullingworth, in his series of 100 cases, reported no cases of salpingitis, and many of the other

1. McDonald, Ellice: Complications and Degenerations of Uterine Fibromyomata, THE JOURNAL A. M. A., May 21, 1904, xlii, 1344.
2. Winter: Ztschr. f. Geburtsh. u. Gynäk., 1906, vii, 1.

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series show similar omissions, which makes it clear that complete routine pathologic examination was not made. For this reason it is thought best that, with this series of 700 cases, no other series be combined in order that the facts as to these changes should be as exact as possible. All these tumors here reported were examined pathologically, macroscopically and microscopically, and the adjacent and accompanying tissues removed at operation were also carefully examined. Thus it may be seen that all possible care has been taken to eliminate any source of error.[3] It is much better that conclusions should be drawn from one series of a sufficient number of cases carefully studied than that erroneous deductions should possibly be made from a large aggregation of inexactly studied cases. Therefore, no attempt will be made to combine this series with those of others or to draw comparisons.

TABULAR ANALYSIS OF AGE, COMPLICATIONS AND DEGENERATIONS OF 700 FIBROID TUMORS

TABLE 1.—CHARACTER OF TUMORS

	No.	%		No.	%
Single	238	34	Subserous	136	19.5
Multiple	462	66	Interstitial	190	27.1
Small	257	36.7	Submucous	75	10.7
Medium	209	29.8	Combined	299	42.7
Large	234	33.5			

TABLE 2.—DEGENERATIONS AND MALIGNANT CHANGES

(A.) Degenerations of Tumors			*(B.) Associated Malignant Changes*		
	No.	%		No.	%
Hyaline	127	18	Adenocarcinoma.	20	2.9
Calcareous	65	9	Squamous carcinoma	6	0.8
Cystic	20	3	Sarcoma	7	1
Hemorrhagic	14	2	Chorioepithelioma malignum	2	0.3
Necrotic	57	8	Total malignant changes	35	5
Adenomyoma	23	3			

TABLE 3.—COMPLICATIONS OF TUMORS

	No.	%		No.	%
Ovarian cysts	53	7.5	Salpingitis	194	27.5
Cystic ovaries	141	20	Appendicitis or Periappendicitis	148	21
Ovarian fibroma	8	1			
Ovarian carcinoma	5	0.7			

3. These cases were studied at the Bender Laboratory and I am indebted to Dr. Pearce, late director, and Dr. Wolbach, present director, for their help.

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TABLE 4.—AGE OF PATIENT

Age.	No.	%	Age.	No.	%
20—30	19	2.7	50—60	95	13
30—40	233	33	60—70	21	3
40—50	332	47.6			

TABLE 5.—RELATION OF AGE TO DEGENERATIONS

(A.) Necrosis

Age.	%
20—30	5
30—40	7.7
40—50	7.5
50—60	9.3
60—70	29

(B.) Calcareous Degeneration

Age.	%
20—30	0
30—40	2
40—50	16
50—60	14
60—70	10

(C.) Hyaline Degeneration

Age.	%
20—30	11
30—40	11.5
40—50	16.8
50—60	16.6
60—70	10

(D). Adenocarcinoma

Age.	%
20—30	0
30—40	0
40—50	3.6
50—60	6.3
60—70	9.5

(E.) Squamous Carcinoma

Age.	%
20—30	0
30—40	0.4
40—50	0.3
50—60	3
60—70	4.6

(F.) Sarcoma

Age.	%
20—30	0
30—40	0
40—50	0.6
50—60	3
60—70	9.5

(G.) Chorioepithelioma

Age.	%
20—30	0
30—40	0
40—50	0.6
50—60	0
60—70	0

(H.) Total Malignant Tumors

Age.	%
20—30	0
30—40	0
40—50	5
50—60	12.7
60—70	23.8
Autopsies	26
Heart Lesions at Autopsy	11.5

These tables include most of 700 cases, 280 of which were reported by me in 1904. The series also includes 26 cases in which myomas were found at autopsy.

The tumors are classified first as regards their character and are recorded in percentages as well as in numbers. They are also classified as to the complications and degenerations and are reckoned in the same way. The age at which the tumors were operated on is also arranged in numbers and percentages as to the various decades. The relation of the necrosis to the age of the patient is also classified and for convenience it is recorded in percentages alone, that is to say the number of cases in each decade can be readily seen from the age table and the frequency of occurrence of each complica-

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individual complication as a percentage of occurrence in the various decades. This was done with the hope of obtaining some idea of the frequency of each complication at the various ages, in order to show whether the influence of the menopause, which is the only argument for the expectant treatment, was as beneficial as has been claimed. For if it proved that with increasing age the frequency of grave complications increases, a weighty argument in favor of early operation has been made.

AGE

The greatest number of these patients came to operation between 40 and 50 years of age, as may be seen from the table, with a less number between 30 and 40, and still less between 20 and 30. Of all the patients operated on less than 3 per cent. were under 30 years of age.

PATHOLOGY

Number of Tumors Present.—The tumors were single in about one-third of all cases and there was more than one tumor in the uterus in two-thirds more cases. This is contrary to the usual belief that myomas are usually solitary, and is an argument against myomectomy when it can be definitely shown that the uterus is not the host of other tumors than the one removed, as, in a number of cases, recurrence of the growth of fibroid tumors after operation has been reported.

Size.—The division as to size has been based on the following scale: small, up to 4 cm.; medium, 4 to 8 cm., and large, above 8 cm. in diameter. In multiple tumors the diameter of the largest tumor was taken as the determining factor. It will be seen that these three classes were almost evenly divided, there being a few more of the small tumors than of the others. The largest tumor noted weighed 90 pounds and measured roughly 50 by 40 by 20 cm. The tumor was removed at autopsy from a woman weighing after the tumor was removed 65 pounds, or less than the tumor itself. The

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tumor was single, showed considerable necrosis and calcareous degeneration, and caused pressure symptoms which brought on the death of the patient. A history of twenty years' growth was obtained from the family physician. It grew rapidly during the first few years and after it had arrived at the size of a six months' pregnancy it grew slowly, but during this time incapacitated the woman from her customary activities. Several other tumors were noted between 40 and 50 pounds in other cases. It will be noted that 234 tumors, or 33.5 per cent., measured more than 8 cm. in diameter. It will also be seen that at least one-third of the women having fibroid tumors do not come to operation until those tumors have reached a large size.

Position.—Analysis as to position of the tumor was not easy, as it was not always evident to which of the classes the growth should go, but if a tumor projected against the mucous membrane or into the cavity of the uterus it was called submucous, and if the greater part of the tumor was outside the uterine body it was classified as subserous. By combined is meant multiple tumors, one of each of which may be classified in one of the divisions. The comparative infrequency of submucous myomata is noticeable.

Simple Degenerations.—The various degenerations can not be estimated macroscopically, but require careful microscopic examination, as the most common one of hyaline degeneration often shows no macroscopic evidence. Hyaline degeneration occurred in 18 per cent. of all cases, and this degeneration with the increase in the age of the patient, as may be seen from the table, was more frequently found in patients between 40 and 60 years of age.

In sixty-five cases (9 per cent.) calcareous degeneration, on the other hand, was present in very few cases below 40 years of age, and was found most frequently between 40 and 50 years of age with slightly decreasing frequency as the patient became older. The amount of

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calcareous degeneration varied very much, in one case being almost complete of the womb-stone type, 10 cm. in diameter, and in others with moderate discrete calcareous deposit. An interesting circumstance was the association of calcareous degeneration in six out of twenty cases of fibroids and adenocarcinoma of the uterus.

There were twenty cases (3 per cent.) of cystic degeneration, and a distinction has been made in this series between true cystic degeneration and necrosis going on to cavity formation. In this series the standard of Alban Doran, that if a fibroid is not truly cystic unless it includes the cavity containing half a pint of fluid, has, however, not been adhered to, but tumors with smaller cavities have been judged to be truly cystic. There were no cysts of large size found, the largest containing approximately 1,000 c.c. of fluid. Cystic degeneration is especially interesting from the fact that many cases of cystic degeneration prove to be sarcomatous or it may be that there is a necrosis going on to cyst formation as in Graves' 4 cases of cystic degeneration, of which 3 were sarcomatous, and in Mary Scharlieb's[6] first series of 6 cases of sarcomatous degeneration, of which 3 were cystic, and of her second series of 100 cases, of which 1 showed sarcomatous degeneration and was cystic, and of the 7 cases of sarcomatous degeneration of this series 2 were cystic and 5 showed necrosis and hemorrhage.

Necrosis.—All stages of necrosis and inflammation were noted. Necrosis occurred mainly in large tumors, in which, from the size of the tumor or other cause, the circulation was disturbed, and was evidenced on section by brownish yellow areas. There was usually considerable edema associated. This degeneration was present in fifty-seven cases (8 per cent.) and was found with increasing frequency as age advanced, being present, as

6. Scharlieb, Mary: Jour. Obst. and Gynec., Brit. Emp., October, 1902; Proc. Roy. Soc. Med., December, 1908.

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is shown by the table of the relation of age to degenerations, in 29 per cent. of patients over 60 years of age, in 9 per cent. between 50 and 60, and less often in the three previous decades. This degeneration is one of the most grave and dangerous changes which may result in a life with fibroid tumors, bringing, as it does, hemorrhage, inflammation, toxemia and peritoneal infection, and for this reason it is important to note that the complications resulted more frequently with increasing age and that the menopause did not bring a relief from this danger, but advancing years increased it.

Adenomyoma.—The percentage of these tumors (3 per cent.) is about that usually found. They offered in this series nothing of special mark in gross appearance.

Cancer.—Adenocarcinoma occurred in 20 cases (2.9 per cent.). It occurred in no patient below 40 years of age and was present more frequently as age advanced. The frequent association of this form of cancer with fibroid tumor has been recognized for some years since the more exact methods of examination, and it was noted in my paper of 1904 that "it seemed at least that, while the association of squamous carcinoma with fibroids is accidental, the occurrence of adenocarcinoma may be more or less influenced by the presence of fibroid tumors." This statement has been borne out by many investigators, notably Piquand, who has collected 179 cases of this association and has reported three cases of his own. Isolated cases, however, have little value or bearing on the treatment, for it must be proved that the liability to cancer is of sufficient importance to constitute an indication for the routine removal of these growths, and to do this, not only must the total number of cases be noted, but the varying percentages of the forms of cancer and the age at which they occur.

Squamous carcinoma was present as an association of fibroid tumors in 0.8 per cent. of cases, and the frequency of this association also increased with increasing age, being present in only one case below 40 years of

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age, in 0.3 per cent. between 40 and 50, in 3 per cent. between 50 and 60, and in 4.6 per cent. between 60 and 70.

From a comparison of these two forms of cancer it will be noted that, while twenty cases of adenocarcinoma occur as a complication of fibroids, only six cases of squamous carcinoma of the cervix are present. In other words, there are three times as many cases of adenocarcinoma as there are of squamous carcinoma. This proportion is entirely the reverse of the usual proportional occurrence of these two forms of cancer, as is shown by Piquand's collection of 1,135 cases of uterine cancer in which he found 100 cases of squamous carcinoma to every 17 cases of adenocarcinoma.

It is obvious, therefore, that, while adenocarcinoma is relatively more frequently in association with fibroid tumors than is squamous carcinoma, this relationship may result from a common etiologic factor, or the fibroids may predispose toward the occurrence of adenocarcinoma of the fundus. The fact that myoma of the uterus, as is well known, predisposes toward sterility and that squamous carcinoma is found but seldom in women who have never had children may have something to do with the apparent frequency of adenocarcinoma. In other words, women who have fibroids have no children, and so are not likely to have squamous carcinoma of the cervix. It is, however, believed that the percentage of sterility in fibroid tumors is much exaggerated and that pregnancy very often occurs with an undetected fibroid.

It may be that the common etiologic factor is in the uterus itself and that there is some quality in the organ which makes it liable to become the seat of fibroids and malignant disease. While a common etiologic factor may play a part in the association of these forms of disease, it is probable that the fibroids have some part in the production of this association, and, while fibroids may bear a causal relation to, or have a common cause

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with adenocarcinoma, the association with squamous carcinoma is accidental, and, while the etiologic relation of the combination of adenocarcinoma with fibroids is obscure, the fact of the large percentage of this complication remains to be taken into account in regard to the treatment of these growths.

Sarcomatous Degeneration.—There are seven cases of sarcomatous degeneration among the 700 fibroid tumors. During the time the seven cases of sarcomatous degeneration were observed, there were twelve other cases of sarcoma of the uterus. It is difficult in some cases to decide whether a fibroid tumor has previously existed in the uterus which is now the seat of extensive malignant disease, for the destruction of the malignant lesion may have caused a disappearance of the fibroid growth or the growth itself may have created tumor formation to simulate the necrotic remains of a fibroid. This is particularly true of sarcomatous disease, and the small percentage in this series compared with others may be due to the fact that no tumor was included in this series unless it was distinctly shown that there was a true sarcomatous degeneration.

This form of degeneration occurred in no patient below 40 years of age, and, as may be seen from the table, it was present between 50 and 60 years in 3 per cent. and between 60 and 70 years in 9.5 per cent. of the cases.

The most marked characteristic of this form of degeneration was the fact that it was almost constantly associated with necrosis or hemorrhage. In fact, the presence of these two conditions should be made an indication for the very careful examination of all the suspicious spots in such tumors. The importance of this examination is well shown by the report of Winter's two series which were referred to above.

Chorioepithelioma Malignum.—There are two instances of this complication, both occurring after abor-

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tion and one infiltrated in the substance of the fibroid tumor. The complication is a rare one and is mainly of interest because of its rarity.

TOTAL MALIGNANT COMPLICATIONS

The total number and percentage of malignant complications of 700 fibroid tumors were 5 per cent., including 20 cases of adenocarcinoma, 6 of squamous carcinoma, 7 of sarcoma and 2 of chorioepithelioma malignum. Of these 35 cases, 27—those of adenocarcinoma and sarcoma—were due to or influenced by the presence of fibroid tumors, while 8 cases—those of squamous carcinoma and chorioepithelioma malignum—were of accidental association; that is, their occurrence was not influenced by the presence of the fibroid tumors.

There was but one case of malignant complication in a patient below 40 years of age. With each decade after 40, the percentage of malignancy increased markedly, being 5 per cent. in the fifth and 12.7 per cent. in the sixth, and 23.8 per cent. in the seventh.

Ovarian Complications.—Parovarian and ovarian cysts have been combined in this classification and occurred in 53 cases (7.5 per cent.) and varied in size. Ovarian fibromas occurred in eight cases (1 per cent.), the largest measured 20 by 11 by 10 cm. There were five cases of ovarian carcinoma, and in three instances the growths were due to metastasis from a gastric tumor. Cystic ovaries (one or both) were present in 141 cases (20 per cent.); the percentage corresponded very closely with Scharlieb's estimation of this complication. This is thought to be due to the undue thickness or toughness of the ovarian boundaries, as there is in almost all these ovaries an increase in the amount of fibrous tissue.

Tubal Complications.—The tubes showed salpingitis or perisalpingitis in 149 cases (27.5 per cent.). In many cases the gross changes were slight and the diagnosis made microscopically. The cases of purulent sal-

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pingitis, pyosalpinx, tubo-uterine abscess, have been classed under this head. This large complication of tubal complications as compared with the small percentage of similar complications found in series in which not all the tissues were examined microscopically shows that the tendency in the tubes is toward inflammatory processes of minor grade which may show but little macroscopic evidence, and it is believed that salpingitis as an association of fibroid tumors is very frequently overlooked because of this lack of macroscopic change.

Appendiceal Complications.—Appendicitis or periappendicitis occurred in association with fibroid tumors in 148 cases (21 per cent.). The most frequent form of this complication was that of periappendicitis and very frequently the inflammation was of slight grade and with small macroscopic change. Both this complication and that of salpingitis, however, show that the evil effect of fibroid tumors of the uterus is not confined to the uterus, but is transmitted to the adjacent and easily affected tissues. It is believed that the evil effect of fibroid tumors on the tubes and appendix is largely mechanical in origin and that to the bruising or traumatism, caused by the presence of a large tumor, may be attributed the moderate inflammatory changes.

Cardiovascular Changes.—A study of diseases of the heart and vessels in patients with fibroid tumors is one which is fraught with great difficulty because of the trouble of making a positive and accurate diagnosis of the heart lesion and of the relation which the lesion bears to the fibroid tumor. Many reports have been made in which the examination of the heart has been made in the most precursory manner and broad conclusions drawn from insufficient evidence. The frequency of functional murmurs of the heart in cases of anemia caused by excessive menstruation or bleeding from fibroid tumors is one of the complications of the diagnosis, so that it must be laid down as a rule in a

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study of the cardiovascular changes associated with fibroid tumors that only autopsy reports or examination by a skilled physician in regard to the condition of the heart should be accepted in the study of the condition.

In this series fibroid tumors were found in 26 women at autopsy. These fibroids occurred among 175 autopsies on women more than twenty years of age; that is, above the age at which fibroid tumors occur. In these 26 autopsies of women with fibroid disease of the uterus, heart lesions were found in three cases (11.5 per cent.). In one case there was fibroid degeneration of the heart muscle with a large tumor which by pressure had caused hydroureter and various congestions with edema of the lungs. Another patient had mitral stenosis, and death was due to anemia and nephritis caused by excessive hemorrhages. In the third case, there was aortic stenosis and mitral insufficiency; death was caused by acute peritonitis caused by rupture of the bladder from obstruction by fibroids.

The cardiovascular tissues are in no way affected by fibroid tumors, but the changes which do occur are due to excessive menstruation or persistent hemorrhage which cause anemia and exhaustion. The changes are secondary to the anemia from hemorrhage or to malnutrition, superinduced either by hemorrhage or by other disturbances caused by the fibroids. But there is no proof that there is any definite or specific influence of a fibroid tumor on the heart or blood vessels other than that produced through anemia and the blood changes.

FIBROID TUMORS AND PREGNANCY

The influence of fibroid tumors on pregnancy must be considered not only from the effect of the tumor on the pregnancy, but also from the effect of the pregnancy on the tumor. In another series of 2,600 cases of pregnancy, 13 cases (0.5 per cent.) of associated pregnancy and fibroids were studied. Among these 13 cases com-

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plicated by fibroids, there were 3 cases of postpartum hemorrhage; one was severe at the time of labor, necessitating manual extraction of the placenta and uterine packing. Two were insidious in character, the uterus contracting well at the time of the delivery of the placenta and bleeding in from one to one and a half hours afterward. In three cases the placenta was difficult of delivery, two requiring vigorous treatment by Credé's method and one manual extraction on account of adhesions to a large fibroid which projected into the uterine cavity and to which the placenta was densely adherent.

In three cases there was malposition of the fetus. This was of minor degree in two and was easily corrected manually. The third case was one in which the uterus was the host of two large fibroids. One of these was the size of a fetal head and situated at the fundus; it was pediculated and freely movable. The other tumor was in the posterior part of the lower segment of the uterus and was the size of an orange. It was fixed and obstructed labor. The child lay transversely and the patient had been sent to the hospital with the diagnosis of placenta prævia on account of the hemorrhage. Cesarean hysterectomy was done and a macerated fetus delivered.

One case of fibroids was seen after a three months' abortion; owing to the retroversion of the uterus and the anterior situation of the fibroid, the diagnosis was between fibroid tumor and ectopic pregnancy. Abdominal section disclosed the true condition, however.

According to Routh, miscarriage occurs in 21 per cent. of all cases of pregnancy with fibroids. It occurred in but one of the thirteen cases.

The condition of the placenta in these cases is of interest. In five cases there were areas of necrosis varying in size from 3 to 6 cm. in diameter; in two cases it was very marked and involved the whole thickness of the placenta. The case in which the placenta was manually extracted had this condition in the most marked de-

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gree. It was adherent to the fibroid tumor and at the site of attachment of the placenta to the fibroid there was marked thinning of the placental tissue. In several other cases there were placental infarcts and one was the seat of the moderate calcareous degeneration.

Four of these patients were carefully examined before and after labor, and again one month after the date of labor, with the idea of determining whether there was any decrease in the size of the tumor in the puerperium. Two cases of interstitial fibroids showed a marked decrease in size, while one was decreased but little. One case of a pediculated fibroid, as large as a Maltese orange, showed little or no change.

From these cases it will be seen that, while obstruction to labor from cervical fibroids is the most dangerous complication, it is not the only one to be dreaded. Postpartum hemorrhage, malposition and infection are not uncommon. Malnutrition of the fetus caused by areas of degeneration in the placenta may be the cause of premature labor and death of the child. The placenta may be adherent to the tumor on the site of degeneration.

With this series of 700 cases of fibroids, pregnancy was associated in 16 cases. In one case it was apparently the cause of marked increase in growth, followed by necrosis of the tumor. In three of the cases there was moderate increase in growth and necrosis, and in almost all of the cases there was marked increase in the symptoms.

The influence of pregnancy on a fibroid tumor is usually an evil one, and, if miscarriage occurs, it is likely that particles of placental tissue may remain attached to the wall of the uterus. If early abortion does not result, increase of growth of the tumor is a common result, and this is frequently associated with other disturbances, as necrosis and hemorrhage into the substance of the tumor. The two cases of chorioepithelioma associated with fibroids occurred after early miscarriage.

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CONCLUSIONS

From these statistics and tables it is possible to draw certain definite conclusions. The tables show that fibroid tumors are subject in a large percentage of cases to a number of dangerous changes and complications. These dangers are almost all increased correspondingly with the age of the patient. This is particularly true of the more dangerous and even fatal complications of malignancy and necrosis.

In consideration of malignancy alone it is probable that malignant changes will result in one case in every 20 of patients between the ages of 40 and 50, one case in every 8 of patients between the ages of 50 and 60, and one case in every 4 of patients between the ages of 60 and 70.

Necrosis, which constitutes one of the most dangerous degenerations, was present in 8 per cent. of all cases. It was found with increasing frequency as the age of the patient advanced and increased with age until it was found in one-third of all cases at about 60 years of age. When it is considered that necrosis can not exist for a long period without producing marked symptoms and causing grave danger to the patient from infection of the tumor and adjacent tissues, it is obvious that an early operation must be considered the only preventive and safeguard against this danger.

It is obvious also that, if the percentage of degenerations and complications increase with age, the patient's risk in respect to the fibroid tumor and the dangers to which she is exposed therefrom also increase with age and that the menopause does not bring a cure to patients with fibroids, but exposes them to graver dangers. The menopause may relieve the hemorrhage from fibroid tumors, but it does not in any way benefit the tumor or lessen its possibilities for evil. The menopause itself is most commonly delayed in such cases.

In view, then, of the large percentage of serious degenerations and complications of fibroid tumors and of

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the great increase of malignant and other complications with age, it seems wise that a physician should advise all patients who have fibroid tumors to have these growths removed; for if they are not removed the probabilities are that the dangers from them will increase with age. It is true that up to the age of 40 years the danger from malignant complications is slight; but before that time the patient is exposed to the occurrence of other grave degenerations.

Those adhering to the classical teaching advise that the tumors should be treated expectantly and that operation should not be undertaken until serious symptoms result. The most serious complications are those of necrosis and malignancy. Where these distinctive symptoms by which the advent of these changes in fibroid tumors could be recognized, the dangers of conservative and expectant treatment might be decreased; but who can say if a fibroid has become sarcomatous or how long a cancer will be confined to the uterus? Sarcoma often occurs without increase of a growth or fibroid, and adenocarcinoma may cause but little additional discharge or hemorrhage in a case of fibroids which has excessive menstruation or bleeding. Necrosis, after its advent in a fibroid, quickly advances, and, after necrosis has set in, the dangers of operation from infection are very markedly increased. It is obvious, therefore, that it is advisable to operate on the patients with fibroid tumors before these conditions occur, as there is no means of prognosticating when they may occur, save that the probability is that the percentage of their occurrence will increase with age, so that operation can not be deferred.

The expectant treatment offers nothing toward the cure of fibroid tumors save the hope that menopause will obliterate some of the symptoms. Treatment by electricity and ergot has fallen deservedly into disuse and the hope of cure by the menopause is now known

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to be fallacious. Were those advocating the conservative treatment to take a stand more properly based on the known facts in the life-history of fibroid tumors, they would advocate the delay of operation until the patient approached the age of 40 years, after which the percentage of more dangerous complications is very markedly increased. The prevention of these many grave dangers is better, however, than the risk of their occurrence, and it is safer that all patients with fibroids should be operated on as soon as possible. In this way but few patients would present themselves for operation below 30 years of age, and in this series there was less than 3 per cent. of patients operated on. After that time but one-third of all patients would be operated on below 40 years of age, so it may be seen that the difference of position between those advocating operation below 40 years of age and those advocating immediate operation is not very great. If operation is done before the grave complications occur, the mortality will be correspondingly low. The case with regard to fibroid tumors is analogous to that of appendicitis. When the operation is one of choice and there are no acute symptoms present, the mortality is very low; when there are acute symptoms, such as necrosis or weakness from marked hemorrhage, the mortality is large. Early operation would reduce the probability of death from embolism, which is relatively so common after operations on fibroids, and there would be but little risk from the cardiovascular and other systemic diseases.

The frequency of inflammatory changes in the Fallopian tubes and appendix, although as a rule they are of mild grade, should be taken into account. If there is inflammatory disease present in more than one-fifth of all cases of fibroid tumors, care should be taken to eliminate this danger at operation and to do such an operation as would offer little possibility of postoperative infection. Myomectomy, while the ideal operation, is

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for this reason often contraindicated, as the dead spaces caused by the removal of a tumor offer a situation for infection.

It is also of the greatest importance that all fibroid tumors removed at operation should be immediately opened by an assistant and examined macroscopically for the presence of adenocarcinoma or sarcoma. These two forms of degeneration may with some experience be usually recognized macroscopically, and these are the forms of malignant disease which may come to operation undiagnosed. Their situation in the interior of the uterus, the presence of the fibroid tumor formation and the fact that hemorrhage is already present make the diagnosis obscure. Squamous carcinoma, on the other hand, is more readily recognized on account of its cervical position and the possibility of direct examination.

If, then, on examinaton of the tumor or uterus, signs of malignancy are found, a complete hysterectomy may be done. It should be remembered that after 40 years of age the probability of malignant change is much increased.

SUMMARY

1. The menopause does not bring a cure to fibroids; on the contrary, increasing age increases the danger from these growths.

2. There is little danger of malignancy arising in fibroids before the fortieth year of the patient, after which time the danger increases with each year.

3. In view of the sarcomatous changes, carcinomatous associations and other degenerations of uterine fibromyomas, early removal is indicated when they are sufficient size to produce symptoms and cause the patients to seek advice. Small uncomplicated fibroids in young women do not require early treatment.

4. Thorough pathologic examination should be made of all fibroids for evidence of malignancy. The tumor

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should be opened at the time of operation and examined for adenocarcinoma or sarcoma. Particular study should be devoted to those tumors which are necrotic, cystic, or both, as among these are found the largest proportion of malignant changes.

5. In view of the large percentage of inflammatory changes in the Fallopian tubes and appendix, these should be examined at the time of operation and removed, if diseased.

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ENUCLEATION OF UTERINE MYOMAS; WHY AND WHEN PERFORMED

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The treatment of fibroids has ever been a mooted question. I can well remember the period when the extrusion of such growths through the long-continued administration of ergot was considered the proper plan of treatment, and the operative measures were principally confined to the reduction of the resistance to the action of the ergot. Not infrequently were seen cases in which the extrusion under this plan was so rapid that the circulation in the growth became affected and necrosis followed. Such a condition was fraught with danger whether a submucous or a subperitoneal growth.

It was not surprising that the futility of medical measures—indeed, their often disastrous effects—should have led to surgery as the means of escape from the discomforts incident to myomatous growths.

The earlier plans of treatment were necessarily confined to growths which were causing symptoms; and it is a well-known fact that the interstitial and subperitoneal rarely produce symptoms of a distressing character until sufficiently large to produce pressure or become visible through distention of the abdomen. The growths of the submucous variety, on the other hand, are very early the cause of discomfort and alarming symptoms from the profuse bleeding and the painful efforts of the uterus to expel the menacing growth.

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The natural history of the extrusion of the latter growths was the origin of the ergot treatment, which was followed until the expulsion brought the growth within reach of the surgeon. Unfortunately it was but a very limited number of cases which were found amenable to such treatment, while medical measures were ineffectual or productive of additional danger to the majority.

Our present knowledge assures us that these patients suffered from weight and pressure of the tumors, from the absorption of toxins generated within them, and were endangered by necrotic and degenerative processes incident to their changing nutrition.

It is not surprising, then, that with increasing experience in operative measures within the abdomen measures should be instituted for the removal of the uterus containing these offending growths. The radical procedure was naturally chosen in view of the fact that the cases selected for operation were those in which the symptoms were so pronounced that the condition was no longer endurable. With a reduction of operative mortality, surgery has been resorted to much earlier in the history of the disease, and some have accepted the dictum that the pickled fibroid is the only fibroid to leave unmolested. The advocates of early operation are confronted with the recognition of the fact that early operation must necessarily result in the arrest of all hope of conception in a large number of comparatively young women, for fibroid growths are recognized as occurring in women between 25 and 40 years of age.

It is true that the presence of fibroids increases the tendency to sterility, but the large number of cases of the coexistence of pregnancy and fibromas demonstrates that they do not make sterility absolute.

The study of the specimens removed, showing the enveloping capsule and the ease with which the tumors could be peeled out, make the consideration of the removal of the growths and the preservation of a function-

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ating uterus seem justifiable. The aim of any capital operative procedure is to save life, but the preservation of the function should be considered as next in importance, especially when the function preserved has to do with the propagation of the species.

Not infrequently a woman will place but little value on her ability to bear children—may, indeed, endeavor to avoid the responsibilities of the marital relation—but when she realizes that some operative procedure is followed by premature menopause she awakens to a realization of the fact that the function lost was one she prized beyond every other, and is so disturbed by her loss that the mental faculties become unbalanced.

The premature menopause frequently produces marked nervous and vasomotor disturbances, which destroy all comfort and pleasure in life. The combinatiou of these symptoms with the mental phenomena induced by the knowledge of inability to conceive leads to mental derangement. As it is beyond our possibility to determine in advance the influence such measures will exert in any individual case, it seems the better procedure, whenever possible, to preserve the uterus and remove the growths.

An advantage of this procedure which is not always apparent to the patient in whom there is a recurrence is that, should the worst come and the growths recur, we can then if necessary do a second operation which will not, in the majority of cases, be required until years after the first. On the contrary, should the removal of the pelvic structures as a primary procedure be productive of deleterious effect, there is no plan by which we can replace the organs, and in many instances there is but little reason to hope for improvement.

I will not attempt to occupy the attention of the Section with the details of enucleation further than by remarking that the operation may be either vaginal or abdominal. The former should be employed only when the growths are limited to those which encroach on the

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uterine cavity or are confined to the lower portion of the uterus, making them readily accessible through a roomy vagina.

In either the vaginal or abdominal procedure, the aim should be to do as little injury to the organ as possible; consequently the number of incisions into the uterus should be limited. The vascular supply to the growths occurs through the vessels of the capsule; consequently the hemorrhage is at times quite considerable and requires the employment of measures for its control. Some operators advocate the application of a rubber ligature about the cervix during the process of enucleation, but I have never found this necessary, as the bleeding can be controlled by pressure forceps direct to the bleeding vessels. Large vessels or sinuses should be ligated by passing a needle armed with a catgut ligature beneath the vessel. The wound or wounds in the uterus should be closed with interrupted catgut sutures and then with a second or superimposed row of sutures to bring the peritoneum in contact over the line of the wound. I formerly closed such wounds with several rows of continued catgut suture, but not infrequently the loose capsular connective tissue is of such low vitality that occasionally all the tissue inclosed in the line of suture will become so devitalized that it will slough out.

In reviewing my own work done to retain the uterus, I find about thirty-seven cases in which fibroids have been enucleated through an abdominal incision, and five cases in which the operation has been accomplished *per vaginam.* A large number of cases of myomectomy either through the vagina or by abdominal incision are not included, but only those in which the growths have been enucleated. In five of the abdominal cases, the operation was performed during gestation, and in all the patient continued to carry the offspring until the completion of pregnancy. In none of the cases has there been any trouble during labor. In several of the patients the convalescence has been stormy or prolonged, and in two

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death resulted. In one patient, a single woman, aged 33, thirteen growths were enucleated. The wounds were closed with several layers of continuous chromicized catgut suture, and finally the sutured surface secured to the lower angle of the abdominal wound. Her convalescence was disturbed. The abdominal wound became infected, and finally there was discharged through it a slough which contained the entire suture material employed in the fundus of the uterus. After a prolonged period the woman recovered, subsequently was married and gave birth in successive labors to two children. Her first labor was unattended by anything abnormal. Following the completion of the second, she went into collapse and died with what was supposed to be a rupture of the uterus and internal hemorrhage.

The growths have varied from one to twenty in number, and from the size of a pea to that of a child's head. The smaller, of course, were multiple. In eight cases the disease of the uterus was complicated by disease of the ovaries or tubes, requiring operation on one or both tubes. In one a hemorrhage occurred which required a vaginal incision some ten days later to evacuate the accumulation. In three cases it has been necessary to reoperate, and in one of them a second time. The latter operation was not for fibroids, however, but for appendicitis, and the opportunity was taken to overcome a ventral hernia. In one of these patients reoperated on, from whom two fibroids were enucleated at the first operation and no vestige of others recognized, at the second operation, five years later, twenty were enucleated and both ovaries removed for diseased conditions. One patient, from whom twenty growths, large and small, were removed eight years ago, now has a large collection, but as the menopause has occurred and they are not producing symptoms I have advised delay.

My analysis of my own cases and the study of the literature has caused me to regard the removal of fibroid

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growths by enucleation as indicated in the following conditions:

1. When the growths are few in number and the structure of the uterus is but little involved. Of course, the fibroids may be numerous but situated so near the surface as to permit their removal with but little injury to the general structure, but the large number indicates a tendency to fibroid degeneration which presages early redevelopment. Where a number of growths of considerable size are present, the structure of the uterus is so spread out and will be so injured as to render an attempt to save the organ attended with danger during the subsequent convalescence and an element of danger in the event of pregnancy and labor.

2. When the growths are readily accessible through the vagina or cervical canal. A growth within the uterus, either a sessile submucous or an interstitial, is readily attacked. Not infrequently, the canal may be partially dilated and the dilatation can be completed by the introduction of tents, or the cervix may be split bilaterally until the tumor is exposed or rendered accessible. The enucleation completed, the cavity may be packed with gauze and the split cervix closed much as is done in an ordinary trachelorrhaphy. The vaginal operations are attended with less constitutional disturbances than in the removal by an abdominal incision.

3. When the woman, whether unmarried or married, is under forty years of age, and particularly when she is childless or has but one or two children. The removal of the growths at an earlier period can not be considered as rendering certain the escape of the patient from recurrence, for one of my patients who had two fibroids enucleated when she was 33 years old five years later had twenty removed. The age of forty, however, is one at which the individual suffering from such growths begins to undergo retrogressive degenerations and when the patient has not previously been fertile pregnancy is much less likely to occur.

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4. When the tubes and ovaries are free from complicating conditions. The existence of tubal or ovarian disease of sufficient gravity (as hydrosalpinx, or pyosalpinx, or ovarian hematoma), to render the probability of conception remote or to necessitate the removal of tubes and ovaries to insure restoration of health, should also be an indication for the removal of the fibromyomatous uterus. While it is true that in the majority of cases the tumors decrease and become quiescent after the menopause, yet they sufficiently often undergo necrosis and other degenerative changes to justify the removal of the uterus.

I have endeavored to indicate the conditions under which the enucleation of myomatous growths may be considered advisable, but it would seem even more important to enumerate some of the conditions in which experience has demonstrated that such a procedure would be inadvisable or even dangerous. On general principles, I would condemn the operation (1) when the woman affected has reached the age of forty, as with the changing conditions incident to the climacteric, the tendency to degenerative processes is increased. The woman who reaches this period unmarried or childless is unlikely to be fertile and the tendency to sterility will be augmented by the disease and the operative procedure required for its relief. I consider it inadvisable (2) when the uterus is spread out by the growth or growths to such a degree that the reconstruction of a functionating uterus will not be feasible, and (3) when the tumors are so distributed in the structure of the uterus that the circulation will be greatly affected in the necessary suturing to replace the disordered structures.

The danger to the patient is so great in both of the classes indicated in 2 and 3 as to render attempts to preserve the organ not only inadvisable but unjustifiable. The patient is endangered during the convalescence from necrosis and infection of the structures of low vitality, from accumulation of blood in the torn

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tissues, and in some cases from extensive sloughing of the devitalized structures. Should she survive the operative danger and subsequently become pregnant, she is still in danger from uterine inertia or from rupture, as evidently occurred in one of my cases.

Enucleation of growths may occasionally be of service in promoting the procedure of removal of the uterus. Its employment reduces the bulk of the mass, permitting more ready access to the tissues of the pelvis. I have made use of it, as have others in many instances, to lessen the bulk and afford more ready access to the deeper structures of the pelvis. But two cases recur to me in which it was of especial advantage. The first was that of a woman who had been subjected to an abdominal incision and the wound closed because the conditions seemed too formidable to justify further procedure. When I opened the abdomen the pelvis was so packed with the growths that the vessels were inaccessible in any direction; but the enucleation of a large number of growths rendered the shell containing the blood-vessels readily accessible and the operation easily completed.

Recently I operated on a woman past the climacteric who had carried a large tumor over eighteen years. Of late she had been suffering from abdominal pain and elevated temperature. When the tumor was exposed it was found firmly fixed, filling the large pelvis, and with the intestines so adherent to its posterior surface as apparently to defy dissection. As progress seemed unfavorable in front, behind or on either side I determined to bisect the mass. Incision disclosed that the uterine wall, nearly an inch in thickness, covered a large necrotic fibroid. This was turned out, the inner surface of the uterus curetted, the bleeding vessels ligated and the organ closed without disturbing the adherent intestines. The convalescence was unusually rapid and satisfactory.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. M'DONALD AND MONTGOMERY

DR. H. J. BOLDT, New York City: I desire to endorse Dr. Montgomery's position as to the limited indication for myomectomy; in other words, myomectomy should not be done when the uterine structure has been greatly encroached on by a large number of myomatous nodules within the organ. I believe that so far as the result of the pathologic examination of specimens made for me goes, the instances in which there was tubal inflammation, and also in which there was change in the condition of the ovary were greated than reported by Dr. McDonald. He reported that 27 per cent. of the patients had inflammation of the Fallopian tubes in assotioa with myomata. As nearly as I remember my results were that between 40 and 50 of all the patients examined had inflammation of the Fallopian tubes. The same holds good of inflammatory conditions of the ovary. When I see an inflammatory condition of the ovaries and tubes it does not mean that the ovaries are in such condition that they require removal. With malignant change taking place in the neoplasm, particularly in patients over 40 years of age, I believe entire extirpation of the uterus is indicated rather than a supravaginal extirpation of the uterus. In patients below or about that period it is more desirable to retain the cervix and the adnexa for obvious reasons, unless there is a question of malignancy. I will also add that in appendicular inflammation, the inflammation is not necessarily present only in those cases in which it is seen macroscopically, but in the majority of cases in which the appendix has been removed it was demonstrated microscopically that there was present an inflammatory condition of the appendix.

DR. G. BETTON MASSEY, Philadelphia: I take some exceptions to the conclusions arrived at in Dr. McDonald's paper. Dr. McDonald spoke, for instance, of calcareous degeneration of the uterine tumor as a reason why the tumor was more dangerous than it was before and should be operated on. I think that in that one particular he is mistaken. My experience with calcareous degeneration is that it is a method of spontaneous cure of a fibroid tumor—a spontaneous atrophy brought about by calcareous deposits capable subsequently of being reabsorbed. I do not regard the calcareous degeneration as a reason for either myomectomy or hysterectomy. Again, evidence of inflammation of the appendix is not a reason for the destruction of that organ. It is possible that it is in just such cases that the man who employs the Apostoli treatment gets his best symptomatic results. Inflammation is curable in other portions of the body, why not in the Fallopian tubes, in the ovary and other pelvic organs? There is but one exception to deal with, and that is when the inflammation is clearly caused by the gonococcus and there is a pus tube. In

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such a case nothing but operation will be of service. I notice that the appearance of cancer in a fibroid tumor is called a "malignant degeneration." I think that in a few years the word "degeneration" as applied to a malignant growth will not be used. We look on cancer in all its forms as a new growth, and a new growth is not a degeneration. Such growths as apparently arise in a fibroid are most likely sarcoma from the beginning. The important point is to differentiate the sarcomas from the myomas, and remove them as soon as the diagnosis is made. There may be a few fibroids that harbor sarcomas, but I doubt it.

Dr. Howard A. Kelly, Baltimore: I have recently studied with Dr. Cullen about 1,600 cases in regard to the liability of malignancy. I agree with Dr. McDonald that we ought to operate when the tumor is large enough to produce symptoms. Often we find that symptoms and certain complications have been due to inflammatory disease. An unusual amount of bleeding or discharge is probably due to malignant degeneration. So, when the tumor is large enough to produce symptoms, we find this case undergoing degenerative processes. I think it is important to make a careful microscopic examination after the operation as to the tumor; then we know what to expect. Many years ago in one of my cases there was an area in the tumor which was sarcomatous but which we did not find. The patient returned later with recurrence of a big vegetative mass in the stomach. I agree with Dr. Montgomery that myomectomy is the operation *par excellence.* When a patient comes to us our first thought is: Can I take out these tumors? Not: Can I take out the uterus? And leaving out the age limit in young women, in the absence of complications I always try to do a myomectomy. But a myomectomy is undoubtedly more dangerous than hysterectomy. I have had over 200 cases of myomectomy and the percentage of mortality is large. The operation is dangerous on account of the possibility of serious secondary hemorrhage and of infection, particularly of the former.

I have only perhaps in the last fifty or sixty cases operated by methods in which I feel secure against this accident. They consist in limiting myself to the cases in which there are not so many tumors. I expose the uterus, tie with a little gauze strip, and bisect the tumor. It is of great advantage to use a serrated instrument. A large vessel supplying the tumor should be clamped as an ordinary bleeding vessel. If after having taken off the pressure and having clamped these vessels, there is still free hemorrhage, they should be tied very carefully as described by Dr. Montgomery. The method of suture is important. The vessels should be caught and sewn together with a strong continuous catgut suture. I sometimes make the figure-of-eight suture which binds the sutures between where they tie and loop. It is the best suture I know

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of in loose flaccid tissue to stop hemorrhage. Most important of all and that which has helped me with my myomectomies and the only thing by which I can feel safe is to close up the wound with a little bit of a drain. It is not enough to interfere with the prompt healing and when I pull it out after two or three days I always know whether there has been hemorrhage. There is always a surprising amount of leakage; if there is too much the wound is opened up. The little telltale drain has been invaluable in enabling me to feel comfortable about the patient. It can be removed on about the third day.

Dr. W. B. Chase, Brooklyn: There seem to be in the minds of the profession generally very indefinite views regarding the pathology and treatment of fibromyoma of the uterus and for this reason I congratulate Dr. McDonald on the statistics which he has given us. If we can impress on the medical mind generally the fact that fibroid tumors of size are dangerous and that when the patient reaches the age of 35 or 40 the danger increases rapidly, we will have reached a state in the medical profession when a very large number of patients who have been allowed to perish can be saved. Now this is the central thought of this paper and if it can be impressed on the medical profession the general practitioner and some of those who claim knowledge in specialties will understand the necessity of not neglecting these cases.

Dr. Stephen E. Tracy, Philadelphia: It is a well-known fact that degeneration of various kinds take place in a large number of cases of fibromyomata of the uterus, and I agree with Dr. McDonald that more accurate data can be obtained from a series of cases studied thoroughly than from a larger number of cases collected from the literature. However, on the whole, I believe the work on this subject has been well done and that the deductions already drawn have been fairly accurate. In comparing the number of degenerations in Dr. McDonald's paper with the number of degenerations in a series of 3,561 I collected, and reports of which I published last year (*Surgery, Gynecology and Obstetrics*, March, 1908), I find that the percentage of some degenerations is more while in others it is less; on the whole the percentage of degenerations in Dr. McDonald's series is greater. The most notable example being that of hyaline degeneration, 1.5 per cent., as compared with 18 per cent. in Dr. McDonald's series. Necrosis was found in 3 per cent. more of the cases in Dr. McDonald's series than in my series. In my series, sarcoma was found in 1.5 per cent. of the cases, as compared with 1 per cent. in Dr. McDonald's series. This paper and also another recent paper by Dr. McDonald on "Fibromyoma of the Uterus complicated by Cancer or Sarcoma," confirms a point emphasized in my paper last year; namely, that the dangers of these tumors are greater after the age of 40. In a series of

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506 cases I found that in over 64 per cent. of the cases the degeneration took place in patients over 40. From a study of additional cases I have found that the percentage of degenerations which take place after the age of 40 is about 70 per cent. I regret that Dr. McDonald did not state the percentage of degenerations which took place after that age in his series.

I was surprised to note in Dr. McDonald's series the large percentage in which there were pathologic lesions in the appendix, Fallopian tubes and ovaries, the percentage being much greater than in any series reported to this date. These lesions I do not consider complications, but simply associate conditions which have no direct relation to the etiology, course or treatment of fibromyomata of the uterus. I agree with Dr. McDonald that cardiovascular tissues are in no way affected by fibromyomata of the uterus. That degenerations of the cardiovascular system, the kidneys, other organs and tissues are associated with fibromyomata of the uterus there is no doubt. This association I believe is due to a common etiologic factor and that the fibromyomata of the uterus are local manifestations of a general pathologic process.

With all the work that has been done and the many excellent papers that have been published on this subject within recent years, it is surprising how frequently a woman is told that her fibroid tumor will be cured by the menopause. Statistics have shown most conclusively that the dangers of these tumors after the monpause increases every day as the patient grows older. When that old, so-called classical treatment, concerning fibromyomata of the uterus is forgotten, and the profession as a whole and the public in general realize the significance of postclimacteric bleeding, which is practically always due to fibromyoma or carcinoma of the uterus, many, many women who now perish will be spared to years of usefulness. I feel that every case should be considered carefully from every standpoint and should not be treated by any fixed, preconceived rule. Broadly speaking, I believe that all fibromyomata of the uterus should be removed when diagnosed, with the exception of small tumors which produce no symptoms, in young women who are anxious for maternity and in whom there is a fair prospect of conception. Such patients should report for examination at frequent intervals, should be watched carefully and be subjected to operation as soon as symptoms arise. I can not agree with those who claim that a woman with a fibromyoma in her uterus runs a more serious risk than she does with a diseased appendix. We all know that the pathologic process will pass beyond an appendix in a very few hours, while I doubt if any surgeon ever saw a woman's life jeopardized when the tumor was removed a few hours after symptoms developed.

Dr. Edward J. Ill, Newark: I am not in accord with the views of those who have advised the indiscriminate removal of

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fibroid tumors. I suppose the object of Dr. McDonald's paper is to indicate that every fibroid tumor that we get hold of should be removed. Has any one taken the trouble to see how many fibroid tumors there are in the world. After much trouble I have succeeded in getting some reports on the number of fibroids found on the postmortem tables in general hospitals. The number of fibroids in women over 35 years are from 4 to 8 per cent. That means that in Philadelphia and within thirty miles around Philadelphia there are 120,000 women with fibroid tumors. Have you heard of anybody removing 120,000 fibroid tumors? Women do not go to their physicians to have fibroids removed until there is a cause for it, in other words until they have got a symptom, and they get symptoms when changes in the tumor or adnexa takes place. The 700 cases reported by Dr. McDonald only shows that 700 women with tumors that have become degenerated in one form or other have gone to their doctor to have them removed. If you will look over the records Dr. McDonald has given us you will see that 1 per cent. of those cases have become sarcomatous. Dr. Kelly has told us that he has seen actual sarcomatous changes in the tumors themselves. Dr. McDonald says these conditions are associated with fibroma.

In carcinoma the fibroid tumor is simply an incident of the disease, the two are not connected at all. Why should not carcinoma be very frequent in all these 120,000 persons in Philadelphia and its environment. As a matter of the fact, carcinoma must be rare in these numbers. There may be 6,000, let us say 12,000 women, who have been operated on in Philadelphia for fibroid tumors. What has become of the other 108,000? No one has a right to remove a fibroid tumor of the uterus unless that woman presents definite and distinct symptoms. I hold that the average percentage of deaths, let us say at Johns Hopkins, the institution which has our highest respect, is 5 per cent.; 2 per cent. became malignant in the shape of sarcoma. Then if the indication for the removal of fibroids is simply the possibility of the tumor changing to a sarcoma we actually have a mortality of 3 per cent. more than it would be if we let all patients go. You see by this what a fallacy there is in figures. Not that I do not wish to compliment Dr. McDonald on this most excellent paper, but his statistics show only diseased fibroids, not the normal fibroids such as there are in the 120,000 women in and about Philadelphia.

Dr. C. Frederick, Buffalo: Dr. McDonald was kind enough to send me a copy of his statistics and I felt in duty bound to say something. I have no doubt that there are a large number of women as Dr. Ill has just said who are going around with fibroid tumors that they know not of, and that we know not of. It is a mighty good thing that they don't know about them too for they would be worrying the life out of their

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physicians. But the fact remains that those women who present themselves to their physicians with fibroid tumors present themselves because they have troubles and those troubles are of the various kinds enumerated in Dr. McDonald's paper, and it falls to our lot to treat those patients in accordance with the indications that their individual cases present. It is not simply the carcinomatous, or the sarcomatous degeneration, or the "new growth," as Dr. Massey would say, but the hemorrhages and the other toxemias that women have that cause the degenerations which come on in their tumors. It has fallen to my lot to see during the course of the last twenty years a number of fibroid tumors that have not been operated on. I have kept track of these women and watched the course of their cases over a period of years. Eleven of them have died and every one as the result of some complication which had its origin in degenerations occurring in large tumors. One of the number I have just recently snatched out of the jaws of death. She is the sister of a prominent physician in Buffalo. I have been watching her case for eighteen years. She refused operation until she was finally forced to it by an ever increasing rise in temperature and the realization that she was approaching her dissolution if something was not done. I took out the tumor and found a large necrotic spot as large as a cantaloupe in the center of it. Fibroid tumors are not benign in their course. They have their period of growth. Then degenerative changes take place and those changes are the ones that kill. I feel that every patient who presents herself with tumors that are producing symptoms should have them taken out.

In women under 40 in whom the conditions are favorable to myomectomy I do that operation. I have had many satisfactory results.

It has been a practice with me over a series of years in cases of fibromyomata to tie off, usually, one ovarian and one uterine artery on opposite sides; for instance, tie off the ovarian artery on the left and the uterine artery on the right side after I have enucleated several large fibroid tumors from the uterine body. Thereby the blood supply is decreased and also the chances of secondary hemorrhage and the tendency to involution of the uterus is increased. It will go back to its normal size a good deal more rapidly and I think there will be better results. But one must be careful to see that there is blood supply. I once tied off both uterine arteries and this was only two or three years ago. Whether the woman had ovarian arteries or not I do not know; she died the second day. Examination showed a gangrenous uterus and that I had cut off all the blood supply.

Dr. F. F. Lawrence, Columbus: I do not believe that the members of this Section can afford to allow the meeting to close with even a possibility of the impression going to the

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general practitioners of this country that the Section approves of leaving, in any place in the body any form of neoplasm without extremely careful supervision and the exercise of the most accurate judgment. The reason that these cases come to the surgeon as sarcoma or as malignant conditions is because of the pernicious teaching that the fibroma should not be removed until it produces symptoms, which has come to mean pressure symptoms. The question is: What is a symptom which can be traceable or should be traceable to a uterine fibroma? How about the neurasthenic patient who is given the rest cure and who has one, two or more fibroid nodules? Have the fibroids nothing to do with the disturbance of the sympathetic nervous system and of metabolism? The question arises: In how many of the women referred to by Dr. Ill were the symptoms directly or indirectly traceable to the effects of the uterine fibromata, how much to broken down nutrition, how much to the wear and tear on the nervous system, how much of the anemia was due to the fibromata. If a woman is taught that a fibromyoma is a neoplasm and as such should be removed, or such supervision exercised as will keep that woman free from malignant degeneration and from the wear and tear on her economy which renders her more liable to other complications the mortality figures will be markedly reduced. Too many times we have waited and doomed the woman. We ought to emphasize to every physician and to every patient that a fibromyoma should be removed, not when it produces gross symptoms, but when it is found.

Dr. E. E. Montgomery, Philadelphia: It is only by an analysis of such a large number of cases as Dr. McDonald has presented, that we are able to know the history of a disease and the profession is certainly greatly indebted to Dr. McDonald for his painstaking efforts in studying and presenting to us the history of this disease. I do not understand that he presents the idea or even wishes us to infer that he would advise the removal of every uterus because it contained a fibroid tumor. I feel that Dr. Ill in his attempt to make a case on this in saying that 2 per cent. of the deaths at Johns Hopkins were due to cancer has ignored the fact that Dr. McDonald said that 8 per cent. of fibroid tumors became necrotic, a condition which is almost as grave, almost as dangerous to the patient, as the development of sarcoma which affected but 1 per cent. He would not, I am sure, lead us to believe that the cases in which the patients died as the result of this operation were those which should be ignored, but they were cases which had been neglected for a great length of time and were infected, cases which are the most dangerous and consequently these are the ones in which the mortality takes place. It is not in the simple case, the case in which the fibroid is small and the operation slight, that death is likely to take place. I would not for a moment

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wish to be understood as advocating operation in every case in which fibroid tumor is recognized; but I do say that such cases should be kept carefully under observation; that the growth of the tumor should indicate early operation, principally for the purpose of trying to save the patient's functions and her power of propagation. When the tumor has gone beyond this early stage and shows extensive development in the uterus we should resort to operation and safeguard the life of the patient.

Dr. E. McDonald, New York City: I have endeavored to put the subject in as practical a way as possible and let the gynecologists decide whether to operate or employ any of the other various treatments of fibroids. In regard to the question of cancer in association with fibroids I do not mean to infer that it was a direct degeneration, this adenocarcinoma of the uterus, but I did mean to make a point of the fact that it occurred much more frequently in association with fibroids than it does in natural course of events; that is to say, in comparison with squamous carcinoma of the cervix, adenocarcinoma occurs in three times as many cases as does cervical carcinoma and the usual percentage is very much the opposite. The question of sarcomatous degeneration of fibroids and direct degeneration of fibroids is well-proved. In the examination of this class of fibroids it is often an easy matter to trace the direct transformation of the fibroid into sarcomatous degeneration. In one of these cases such a small-nucleus was overlooked and the patient went for two years, returning with a recurrence of the growth. The tumor which fortunately had been preserved was again looked over and on making new sections it was found that there was a small sarcomatous point in the tumor. I did not wish to make a point of calcareous degeneration. It is well-known that calcareous degeneration occurs mainly in dead tissue and if there is dead tissue in fibroids it is a very dangerous condition. Almost one-half of the cases which occurred in association with adenocarcinoma were calcareous. The explanation I do not know. It may be that the decrease in the blood supply and the deposition of the calcareous masses may have something to do with the occurrence of the adenomacarcinoma, but I have not found anything that confirmed that. I offer that as a possible explanation. The forms of cancer which are not likely to be recognized at operation are adenocarcinoma and sarcoma. These are the forms which occur in the interior of the uterus. Carcinoma of the cervix would be recognized by normal examination; but adenocarcinoma and sarcoma may be overlooked. Sarcoma may occur in a fibroid without increased growth; but more commonly if a fibroid does suddenly take on renewed growth I consider that operation is urgently indicated because these cases are frequently sarcomatous. If at the time of operation supravaginal hysterectomy is done and there is

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found evidences of adenocarcinoma or of sarcoma, which two forms of tumor are usually easily recognized macroscopically, the cervix may be taken out afterward and it is well to remember that these forms of malignancy occur more frequently after the age of 40. From 40 to 50 years of age the percentage of malignancy is given as 5 per cent.; from 50 to 60, 1 patient in every 8 has malignant change; from 60 to 70, 1 patient in every 4; so that the percentage increases markedly with age and with each succeeding decade.

The percentage of fibroids in various races varies markedly. In the negro, fibroids occur frequently; in the Jews, infrequently. In a study of autopsy records among the women in the upper part of the State of New York, above 20 years of age, 14 per cent. had fibroids. We can not operate on all these, for as Dr. Ill has said, they do not come to us. If they do not come symptoms are not being produced. I do not mean that we should operate on fibroids unless they produce symptoms. The mortality of fibroids will increase markedly with the urgency of the symptoms and the urgency of the operation. The operative prognosis of fibroid tumors is almost analogous to that of appendicitis. If the operation is one of choice the mortality is small; if one of necessity, there are more complications, such as necrosis, infection and cancer, and the mortality will be large.

If my paper deserves any credit it is due, not to myself, but to my former teacher, Dr. Charles P. Noble, of Philadelphia, who has done so much for the pathology and for the study of the life history of fibroid tumors and to whom is also due the scientific attitude of the profession in regard to the treatment of this dangerous disease.

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A STUDY OF THE ANATOMY AND THE CLINICAL IMPORTANCE OF THE SACRO-ILIAC JOINT*

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Some time ago the writer was much surprised, on reading the literature of the minute anatomy of the sacro-iliac joint or synchondrosis, to find such a marked disagreement among the most prominent anatomists and gynecologists. To quote in brief from some of them: Morris holds that even the presence of synovial membrane is not constant, stating that it is more apt to be present in the female. Luschka believes that a small amount of synovial membrane is always present and that it increases in size at times of pregnancy. Cunningham states that the synovial cavity is imperfect and rudimentary, but believes that hyaline articular cartilage exists usually. Testut, the great French anatomist, mentions certain folds of synovial membrane which occur here and there, filling up gaps or margins of the fibrocartilage. Morris denies that there is any appreciable movement at this synchondrosis. Williams (in 1903) states that "the articulation between ilium and sacrum is described as a synchondrosis, but is really a joint, on account of the presence always of more or less synovial membrane." Kuttner asserts that it is a joint

* From the anatomic laboratory of Cornell University Medical College.

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with motion and that the horizontal position increases the true conjugate diameter of the pelvis by 6 mm. and Walcher's position by 9 mm., as compared with the lithotomy position.

On account of the above-mentioned disagreement of the best authorities as to the anatomy of this joint, with emphasis on the term "joint" rather than synchondrosis, I was induced to ascertain, if possible, by the dissection of a sufficient number of joints, its true anatomy. By the kindness of Professor Haynes an abundance of material was furnished me at the Cornell University Medical College.

The results of this work are briefly as follows: In the careful dissection of fifty specimens a perfect joint, composed of all its elements, such as synovial membrane and cavity, and strong well-formed capsule was found in each instance, and proved to be as constant in its size and relations as any other joint. Before opening the joints many were injected with an aqueous solution of methylene blue, which colored the synovial membrane so that it could be seen to distend and retract all along the anterior-inferior aspect of the joint when motion was elicited. This part of the capsule is very thin, which accounts for the fact that infection of this joint is very prone to discharge by this avenue into the pelvis and rarely through the very thick part of the capsule posteriorly; also, this part of the capsule often ruptures in symphysiotomy, and in case of puerperal sepsis opens the joint to infection. Sansten states that it ruptures in 44 per cent. of cadavers below 6 c.c. of pubic separation. The lumbosacral cord passes in close proximity to the joint at its lower third, and undoubtedly is frequently involved in affections of this joint, thus explaining the presence of persistent pain in the distribution of this nerve, i. e., sciatica.

The articulation is easily opened by incising the anterior part of the capsule and forcing the pelvic bones apart in front, the symphysis pubis having already been

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separated. The sacrum and the ilium swing on the posterior and interosseous ligaments, as a door on its hinges. Hence the infrequent interference with locomotion and permanent injury of this joint following symphysiotomy.

In my dissections the interosseous ligament always separated from the ilium and never from the sacrum. The round ligament sometimes ruptured and sometimes its bony attachment. The anterior or auricular portion of each articular surface was covered with a thin plate of cartilage, which was thicker on the sacrum than on the ilium. It averaged, in the fifty specimens, in its greatest length, 7 cm. (2 3/5 inches), and in width 3 cm. (1⅛ inches). The largest joint area of hyaline cartilage was 8 cm. (3 1/16 inches) in length and 3 cm. (1⅛ inches) in width. The smallest was 6 cm. (2¼ inches) in length and averaged in width 2½ cm. (15/16 inches).

The posterior irregular part is the attachment of the interosseous and round ligaments, around the latter of which most of the motion occurs as about an axis. One joint was affected with osteoarthritis and the anterior part of the joint was obliterated with bony deposit, which also extended into the posterior ligament.

Let us now consider briefly the mechanics of this articulation. The sacrum is an inverted key to an arch suspended principally by the posterior sacroiliac ligament. The base of the sacrum, in the upright position, projects forward beyond the articular surfaces of the ilium and has a tendency to tip down. This is prevented by the sacrosciatic ligaments, which tie the lower part of the sacrum to the ischium. Here is a great articulation placed at the cross-roads, so to speak, between the trunk and the thighs and mechanically imperfectly constructed to sustain sprains and injuries.

Distinct motion was elicited and measured carefully in every specimen except one and motion was absent here, as stated above. These researches were carried on

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in conjunction with Dr. Henry L. Taylor and will be reserved for a future publication. Sixteen of the cadavers were placed in Walcher's position[1] and the true conjugate diameter of the pelvis averaged an increase of 8 mm. (⅓ inch). Walcher obtained 9 mm. on the living subject.

My interest in the pathology of this joint was first stimulated by seeing a case of relaxation of this joint with Dr. Goldthwait of Boston in 1903. This was before the publication of the monograph on this subject by Dr. Goldthwait and Dr. Osgood, who were the first to demonstrate the existence of such a condition. The relaxation in the case referred to was caused by lying for a very long time in the position of dorsal decubitus following a pelvic operation.

Under favorable circumstances, however, this joint will stand much abuse, as in the case of a symphysiotomy. Edgar reported five cases in which he obtained from 2 to 2½ inches of separation at the symphysis followed by firm union and without symptoms. Nevertheless, this articulation is liable to all the affections of other joints and in the event of infection the prognosis is often serious, because, first, it is very likely to be a metastatic infection from some other part of the body, and, second, as described above, on account of the danger of spontaneous drainage forward into the pelvis.

ILLUSTRATIVE CASES

CASE 1.—*History.*—Miss N. M., was seen by me Feb. 25, 1906. She worked in a web factory; her previous history was negative. Last October she fell over a large stone in the country and strained her back, and was in bed two weeks. This was followed by inability to stoop, lie on back, or stand on right foot, without severe pain in extreme lower part of the back, which always remained in the same place and became more severe at her menstrual periods. The patient's only comfortable posture was lying on the left side.

Physical Examination.—Total lateral spinal curvature to the left. Spine normally flexible. Hip and other joints nor-

1. Patient on back with her legs hanging over the edge of the

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mal. Very distinct tenderness over lower part of right sacroiliac joint. Goldthwait's symptom present, i. e., pain in region of sacroiliac articulation, when the thigh was flexed with extended leg to a right angle or less. Pain produced by standing on right foot; most severe, however, when patient attempted to turn over, while in a reclining position.

Treatment.—Pelvis was encircled by very tight two-inch bands of surgeons' adhesive plaster just below the anterior-superior spines of the ilia. Patient reported in one week entire relief. The strapping was reapplied, at periods of a week, four times. A long corset with a four-inch elastic webbing belt at bottom to grasp the pelvis was then made, which has been worn with entire relief every since.

CASE 2.—*History.*—Miss A. O., aged 15, was referred to me by Dr. A. A. Crane, Waterbury, Conn., Feb. 20, 1906. She attended school and practiced on the piano a good deal. Previous history was negative. The patient has had pain continuously in lower part of back ever since falling on the ice three years before. There was an increase of pain at the time of each menstrual period, although menstrual fluid had not appeared. Pain was produced by walking, sitting, especially on the affected side, or laying on the back. The patient never lays on the back, always on the left side.

Physical Examination.—Fairly well developed and nourished girl. Examination negative except for marked total spinal curvature to the left. No rotation. Tenderness over upper part of right sacroiliac joint. Spine normally flexible except in its extreme lower part. Goldthwait's symptom markedly present. Pain elicited by patient standing on right foot and lying on the back.

Treatment.—This was same as first case. The relief was marked, although for three years the patient had been under constant treatment without the slightest amelioration of the symptoms. Three months later the patient reported that relief had continued and that she had gained ten pounds in weight.

I am indebted to Dr. H. H. A. Beach and Dr. R. B. Osgood for the privilege of reporting the following case:

CASE 3.—*History.*—F. C. R., a man, aged 23, entered the Massachusetts General Hospital, Dr. Beach's service, Sept. 28, 1905; occupation, mechanic. Past history was negative; no rheumatism. Three months before, while carrying one end of a heavy canoe the patient stepped into a hole and felt something slip in the lower part of his back. This was fol-

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lowed immediately by pain when sitting or turning in bed. The patient and his friends noticed that his right hip was becoming more prominent than the left. The pain increased also.

Physical Examination.—Very frail physique. Thorax and abdomen negative. Body tilted to left when patient stood, set or reclined. Flexing extended leg on pelvis caused pain when a right angle was reached. Forward and backward motions showed that the spine is held rigidly on the pelvis. Lateral motions of the spine were normal, from the mid-dorsal region upward. An *x*-ray picture showed a dislocation of the right sacroiliac joint.

Treatment.—Ether was given October 6 and Dr. Osgood reduced "the right ilium to its normal position, so that its crest came on the same level as that of the left ilium and so that the sacrum seemed in its normal relations." A long plaster-of-Paris jacket extending well over the hips was then applied, with the lumbar spine in extreme lordosis. I saw this patient Oct. 8, 1905, and at that time he was walking about without pain or deformity.

CASE 4.—*Patient.*—M. G., a married woman, aged 35, was seen at the Post Graduate Hospital in June, 1906. Past history was negative. One year ago patient had a very difficult labor, forceps having been necessary. The convalescence was normal except for a great deal of trouble with the lower part of the back, on account of which she remained in bed six months. Patient stated that the first thing she noticed was pain and "a grating sensation" in that region, and indicated the left sacroiliac joint as its location. The grating lasted two months and slowly disappeared. The pain, however, persisted unabated and was much exaggerated at her menstrual periods. Stooping, standing on left foot and lying on back, caused pain in this region.

Physical Examination.—Patient well nourished. Total spinal curvature to right, patient sitting more comfortably on the right side. Tenderness to deep pressure over lower part of the left sacroiliac joint. Goldthwait's symptom present.

Treatment.—Pelvis was strapped and relief was immediate. The strapping was continued for six weeks and then a long corset with a webbing belt was fitted. The relief had continued when the patient was last seen.

CASE 5.—Dr. M. H. was attending the lectures at the Post-Graduate Medical School in July, 1907, when I demonstrated a case similar to the above cases. The relief from the strapping was so marked that the patient threatened to leave a cane, on which he was so dependent only a few minutes before. Dr. M.

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H. was so impressed with the similarity of his own symptoms that, after the lecture, he came to me and stated that he felt sure that he was suffering from the same condition. He said that he had sought relief without avail, from many sources, including his colleagues and several members of the faculties of the Post Graduate Medical School and the Rush Medical School in Chicago, of which latter school he was a graduate. He had been thrown from the back of a horse two and a half years before, from which time symptoms dated. The result from the above-mentioned treatment in his case was as striking as in the case he had just seen.

A sixth case represents, with the postoperative case already cited, a class in which a relaxation occurs from a long-continued strain on the ligaments, as contrasted with a sudden trauma.

CASE 6.—The patient was a man aged 45; his symptoms dated from the time he had held, for a considerable time, in a stooping position, a heavy plate-glass window, while a fellow workman fastened it in place. This patient had a convalescence similar to the others but slightly prolonged, which, by the way, is very liable to be the case in this type of trauma, according to my experience.

CASE 7.—*History.*—M. G., a man, aged 21, was seen May 12, 1907. For the past year the right knee had been very painful and had been in a plaster-of-Paris splint most of the time. The patient had used crutches most of the time. His general health had declined and he had lost considerable weight. Four months before he was seen he began to have pain in the lower part of the back, especially when walking, stooping or turning over in bed. The past few weeks the pain had become much more severe. The decline in the general condition had been more rapid. The appetite had become very poor and the patient thought that he had a fever each afternoon.

Physical Examination.—The patient was very poorly nourished and pale; temperature 101 F. at 3 p. m. There was considerable swelling about the right knee. It was flexed about 15 degrees and very sensitive to slight passive motion. Condyles of femur were apparently enlarged; tibia somewhat subluxated. There was a total lateral curvature of the spine to the left. The lumbar region was held very rigidly. There was considerable swelling and deep fluctuation over the right side of the sacrum. A rectal examination disclosed a tumefaction and questionable fluctuation on the right side of the pelvis in the

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region of the anterior-inferior part of the sacroiliac joint. A diagnosis of tuberculosis of the knee and the right sacroiliac joint, with secondary infection and rupture of the latter into the pelvis was made.

Treatment.—An incision over and down to the joint was made posteriorly. The portion of the ilium overhanging and obscuring the joint was chiseled away and apparently good drainage secured. The patient rallied somewhat after the operation and disappeared from observation. His death was reported two months later.

CONCLUSIONS

1. The sacroiliac articulation has all the elements of a joint and therefore has a similar pathology.

2. It has motion and plays an important rôle in labor.

3. Its variation, according to individual, age or sex, is very slight.

4. Its anatomy is such that drainage into the pelvis is very apt to occur, and, therefore, in the event of infection, early posterior drainage is often indicated.

5. Its affections are, undoubtedly, the cause of many obscure and unexplained backaches and persistent sciaticas.

6. The important ligaments of this joint are so placed that the sacrum and the ilium swing open, in the event of a symphysiotomy, as described above, and little permanent damage results, even if the pubic separation has been great enough to rupture the unimportant anterior-inferior part of the capsule.

7. The relaxation of this articulation should be guarded against by support of the lumbar spine with pillows, etc., in cases of protracted postoperative convalescence. Undoubtedly, many here can recall instances of Nature's warning, in the form of a convalescent's backache, which the nurse so readily relieved by merely placing a pillow under the lumbar spine.

125 West Fifty-eighth Street.

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ABSTRACT OF DISCUSSION

Dr. C. C. Frederick, Buffalo: The important point that the paper raises is the differential diagnosis between conditions in the female pelvis that are due to pathology of the female pelvic organs and those conditions which so simulate disease of the pelvic organs, but are not due to disease of these organs but to the conditions that Dr. Albee has just mentioned. Over a long series of years we have all had women come to us, young and old who have been treated by all the various methods employed for the relief of pain in the back, pain down over the appendix, pain in the ovarian region, tenderness in the pelvis, etc., the pelvic organs being blamed for the pain, discomfort and neurasthenia. If we go back into the history of these women we will find a fall or accident to which at the time little attention was paid. Gradually, however, symptoms developed over a number of years and the women have become semi-invalids with neurasthenic symptoms, pain in the pelvis, dysmenorrhea and all the ills of women. A pelvic examination in every one of these cases will elicit the greatest amount of hyperesthesia. The vagina, uterus, tubes, introitus are tender. Every bit of tissue below the brim is tender, presumably due to some intrapelvic condition. The patients have been tamponed and treated and it is almost impossible to convince the attending physician and the patient that the condition is not intrapelvic but due to trouble in the sacroiliac joint. This can be easily proved in a certain number of cases by the relief that comes from good hip support and support of the iliac joint. The period of time that elapses and the persistence with which the treatment must be followed up, the slowness of recovery from the injuries done to the tissues about the sacroiliac joint, and especially to the delicate nerve distribution make the hope of the patient ofttimes drop below par and cause her to think that a mistake in diagnosis has been made. I believe, however, that almost every one of these patients can be cured by the use of the hip bandage, leaving out of the treatment all intrapelvic tinkering and everything addressed to the intrapelvic organs. I have seen women whose ovaries have been removed, who have been curetted and subjected to other operative procedures and yet the pain has persisted.

Dr. Reuben Peterson, Ann Arbor: I want to speak of just one phase of the subject, not of the difficulty of diagnosis in these cases—although we know that that is hard enough. If one is not fortunate enough to be associated with a competent orthopedic surgeon I have found it most difficult to make a correct diagnosis, for it is by no means a simple matter to say in one case, this is due to pelvic disease, and in another this is the result of sacroiliac disease. Some time ago I looked into the question of the pain my patients experienced after operation. It seemed to me that it was all out of proportion to what it should be, and almost in-

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variably the pain was in the back. I have no doubt that others have had the same experience with patients after operations. Finally, my head nurse suggested that the pain might be due to the patients lying for some time on a hard operating table. At that time we used the ordinary pad seen on most operating tables. This pad was changed to one made like a mattress, between two and three inches thick, and covered with rubber with a sterilized covering over that. Ever since I have employed this kind of pad for my operative work, even in prolonged operations, my patients have not suffered pain in the back. Then I had the pleasure of hearing it scientifically explained by Dr. Goldthwait of Boston, who showed that either in the Trendelenburg or the lithotomy position, when the assistant inadvertently leans on the legs of the patient, strain comes on the sacroiliac joint. Many times we have relieved the pelvic condition but our patients have been worse because of this sacroiliac strain. We are just beginning the study of this complication and it is only by working in conjunction with an orthopedist or studying under him, that the gynecologist can ever make headway in the treatment of pain in the sacroiliac region. Certainly it has opened up a field that the gynecologist never before suspected and the results of such study ought to be of great assistance to our patients.

Dr. C. W. Barrett, Chicago: I recall a case in which with pelvic infection following abortion there was inflammation of the sacroiliac joint, giving marked tenderness on deep pressure over that joint, but more marked tenderness on succussion of the pelvis. Succussion on the trochanters and crests of the ilium gave marked pain in the right sacroiliac joint. The treatment of the pelvic infection caused that to subside, or it subsided, without treatment and the joint recovered from the inflammation without any drainage or any direct treatment for that condition.

Dr. Myer Solis Cohen, Philadelphia: I think this discussion should not close without mention of Dr. Goldthwait's work regarding the conditions caused by straining of the sacroiliac joints. He shows that by standing in an improper position the curve of the spine is lost, the sacrum tilted backward, and strain put on the sacroiliac ligament. He also shows that the straight front corset and other bad forms of clothing cause lordosis which tilts the sacrum forward, thus also straining the sacroiliac ligaments. He also calls attention to accidents such as falling from horseback as being responsible for this condition.

Dr. A. J. Winebrake, Scranton, Pa.: The sacroiliac joint is more abused from ignorance than any other joint in the body. It is much abused by the ignorant practitioner in the application of forceps who has no time to wait and knows nothing of the mechanism of labor. He makes the high application of

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forceps and pulls with all his brute strength and the patient is rendered practically an invalid, due to injury to this joint and soft parts. This abuse is going on all over the country. In the race for money men have not time to wait in the practice of obstetrics and give Nature a chance. We are taught not to make examinations because there is always danger of infection. This is a grave mistake. An examination can be made with safety if the examiner is as careful in putting the finger into the vagina as in putting it into the abdomen. Something will then be known about the mechanism of labor in the abnormal case. It is surprising how many turns the head will make which cannot be guilded with a pair of forceps. I think that Cesarean section is a simpler operation than high forceps application. The latter operation in my opinion requires more mechanical skill and more good judgment than Cesarean section.

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AN OVARIAN ABSCESS CONTAINING A LUMBRICOID WORM WITHIN THE CAVITY

BACILLUS COLI COMMUNIS INFECTION

HENRY D. FRY, M.D., Sc.D.
WASHINGTON, D. C.

Patient.—M. J., colored, primipara, aged 23, was taken sick suddenly, Jan. 21, 1909, with pain in the lower abomen, followed by chills, restlessness, and vomiting. No information of importance was elicited from her family history.

History.—For some time before her present illness began, her appetite had been poor; she had suffered pain in her lower abdomen, and nausea after eating; her bowels usually moved twice daily.

Examination.—Jan. 23, 1909, she was admitted to Garfield Memorial Hospital. Her tongue was coated with a grayish white fur; facial expression was drawn; she was in dorsal decubitus position with knees flexed. Pulse was 132; temperature, 103; leucocyte count, 20,560. The abdominal muscles were rigid, especially the left rectus; there was tenderness on pressure over both ovarian regions; on the left side a mass was outlined as big as a hen's egg. Vaginal examination revealed double salpingitis and a large mass on the left side. The afternoon of the day of admission she vomited a lumbricoid worm about 10 centimeters long. Microscopic examination of the feces showed numerous ova of the *Ascaris lumbricoides.*

Operation.—She was kept under observation until the acute symptoms had subsided. Temperature fluctuated between 98 and 102.5 F., and remained normal after February 5. Leucocytosis was 14,750. February 9 operation was performed at my clinic, assisted by the house staff. The right appendage was inflamed and adherent. The left ovary and tube were adherent to the cornua of the uterus; the ovary was enlarged to the size of a hen's egg, the surface was smooth, and there were no intestinal adhesions. While enucleating the mass the ovarian wall of the abscess sac ruptured. About 30 c.c.

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of pus escaped into the abdominal cavity, and projecting from the abscess through the tear in the wall was a small lumbricoid worm about 6 or 7 centimeters long; it was dead and flattened. Both tubes and ovaries were removed. The patient made an uneventful recovery.

Pathologist's Report (by J. B. Nichols).—Ovary enlarged. Dimensions: 6 cm. long, 4 cm. thick; yellowish-white color. Section shows an abscess cavity throughout its entire length. This is irregular in shape and its wall is not smooth but ragged. The wall is pearly white in general with areas of light yellow throughout. Cavity contains pus and a single worm 6.5 cm. long, identified as *Ascaris lumbricoides* by Dr. B. H. Ransom of the U. S. Department of Agriculture. The outer surface of the ovary is smooth and the abscess wall is from 3 to 5 mm. thick, except at one point, where it is only about 1 mm. The external surface at this point is perfectly smooth.

Microscopic Examination.—Extensive aggregation of round cells, mingled, especially in places, with polynuclear leucocytes. These cellular areas broken up by strands of dense fibrous tissue. Round cell aggregations apparently inflammatory areas.

Bacteriologic Examination.—*B. coli communis* in pure culture from pus.

The female lumbricoid deposits eggs in the human intestine, whence they are expelled with fecal matter. Embryonic development takes place in water 5 or 6 months after expulsion. During summer heat the development is more rapid, but in autumn and winter the egg can remain five, six or seven months without presenting the least trace of segmentation. According to Blanchard,[1] the egg passed in the feces produces an embryo in time varying from several weeks to one or two years. Carried into the human intestine by drinking water, the embryo gains liberty from the egg envelop and grows into adult state. The development is rapid and the female worm extrudes ova at the end of one month. The life of the worm does not exceed one year.

Lumbricoid worms are expelled in feces; are vomited; are passed out through the mouth or nares; through the

1. Traité de Zöologie médicale, Paris, 1889.

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Eustachian tube and external ear; through the nasal fossæ and lachrymal ducts to the inner angle of the eye.

Lumbricoid worms travel extensively through natural and artificial passages. They are passed into the trachea and cause death by suffocation and by gangrene of the lung. They have been found in the pancreatic duct; in the common bile duct; in the hepatic and cystic ducts, and in the gall bladder. Hepatic abscesses have been caused by lumbricoid worms. They have perforated the intestines and escaped from the peritoneal cavity into the pleura; through the ventral wall; through umbilical and inguinal tumors and into lumbar and psoas abscesses. Hippocrates reported a worm expelled from an appendiceal abscess. Numerous cases of a similar kind have been reported since.

The genitourinary tract has not escaped invasion by the *Ascaris lumbricoides*. Blanchard mentions the following cases:

Alghisi: Infant, 7 years of age, passed through the urethra in one year 60 worms—ascarides and oxyures.

Chapotin: A negro, 20 years old, passed by the urethra a number of ascarides from 3 to 4 cm. long.

Cases by Kingdom, Krakowitzer and Du Jardin of lumbricoid worms passed with the urine at intervals from eight or ten days to several months.

A fistulous tract leading from the bowels to the bladder was demonstrated by autopsy in the cases of Pereboom, Kingdom and Krakowitzer.

Anciaux reported a woman who passed lumbricoides from the vagina by a fistulous tract to the bowels.

Numerous cases have been reported of round worms having been found within the vagina. Bedel reported a case of hydrometritis complicated by the presence of a lumbricoid worm within the uterus.

The *Ascaris lumbricoides* gains access to the genitourinary passages of the male and female by passing from the intestines into the peritoneal cavity; by fistulous tracts communicating with the bowel; and by passing externally from the anus into the vagina or urethra.

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The only case I can find recorded of the presence of these worms within the ovary is that of Dufour:[2]

A girl, 17 years old, was operated on Aug. 28, 1904, at the Hôpital St. Pierre for a multilocular cyst of the right ovary. The intestines were adherent to the cyst, and in detaching them a tear in the cyst wall gave escape to a viscid, gelatinous substance, and projecting from the opening was found a lumbricoid worm. It was removed; a second worm was found, and then a third. They were alive. An examination of the portion of the intestinal wall that had been adherent to the sac revealed two small perforations.

In my case it is evident from the condition found at the operation and from the examination of the pathologic specimen that the lumbricoid did not pass from the intestine to the ovary. The only satisfactory explanation is that it migrated through the vagina, uterus, and tube to the ovary, where it gained access to the interior through a ruptured Graafian follicle.

2. Dufour, E.: Cas de kyste de l'ovaire renfermant des lombrics vivants; double perforation intestinale, Gaz. de gynéc., xx, 97.

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OVARIOTOMY AND MYOMECTOMY EARLY IN PREGNANCY, WITH FULL-TERM DELIVERY

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The relation of sterility and fibroids of the uterus has been widely discussed and two opinions defended by the opponents. One teaches the theory that the sterility is due to the growth in the uterus, while the other insists that the tumor is the cause of the sterility.

As the cause of tumor formation in the uterus is not known, the opinions expressed are but a speculation. One opinion is entitled to as much consideration as the other.

Fibroid tumors of the uterus are found in women under different modes of life; the married, the unmarried, the sterile as well as the fruitful are subject to this disease. These tumors are found in women who have suffered infection of the genital tract, and also in those who have never had an infection. They are found in the virtuous as well as in the morally lax, in the virgin as well as in the sexually promiscuous. In some cases the tumor appears early in life, in others later. The growths occur in women living in luxury as well as in their sisters of hard toil. They occur in women of all races, although the colored race is said to be more liable to these tumors.

It is not known to what extent the physiologic congestion occurring periodically in the genital organs during menstruation is responsible for these tumor forma-

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tions, or if a responsibility can be put on this function at all.

In this connection there is a case on record by Sutton[1] which is of interest. In this case a tumor supposed to be a fibroid was present for ten years in the uterus of a childless woman, twice married, who had never menstruated or shown any evidence of physiologic ovulation.

Emmet,[2] who has studied the subject of disturbed menstruation in fibroids and their relation to sterility, expresses himself as follows:

> Between the ages of thirty and forty years the unmarried woman is fully twice as subject to fibrous tumors as the sterile or the fruitful. I have already pointed out that this is one of the tributes which an unmarried woman pays for her celibacy. It seems as if it were the purpose of Nature that the uterus should undergo the changes dependent on pregnancy and lactation about once in three years throughout the child-bearing period, and that if the uterus is not physiologically occupied in child-bearing a fibroid will the more rapidly develop into a fibrous tumor as the woman advances in life. This will also be the case with the married woman who has taken means to prevent conception, as well as with her who has been sterile from some cause beyond her control, but to a less degree in the latter case. Finally, the woman who may have been fruitful in early life may have a tumor develop, but is less liable thereto from having once borne a child.

On the other hand, Haultain[3] holds that "sexual excitement in marriage favors the growths of fibroids; that fibroids tend to prevent child-bearing, and, further, that pregnancy in many cases, by promoting their growth, prevent conception in the future."

A fibroid tumor may lie dormant for a long time in the uterus of a sterile woman; she may then conceive, and with the conception the tumor grows and becomes an active factor in causing an abortion of premature labor later in the pregnancy.

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1. Sutton: In Allbutt and Playfair's System of Gynecology, ii, 562.
2. Emmet: The Principles and Practice of Gynecology, Edition 3, p. 549.
3. Haultain: In Allbutt and Playfair's System of Gynecology, p. 564.

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A case of this kind came under observation last year.

CASE 1.—*History.*—Mrs. G., aged 35, had been married fifteen years. She had one child two years after marriage but had not conceived since. She had a small fibroid in the uterus, the existence of which she had known for many years. The tumor never produced any symptoms. Six months previous to my examination she stopped menstruating but did not think that she was pregnant. The amenorrhea extended over four months; then she began to flow moderately. At first she thought it was a menstrual period; the flow continuing over six weeks convined her that something was wrong. She consulted her physician, who called a consultation. Under a light chloroform narcosis a large tumor complicating a pregnancy was made out. She was transferred to the hospital for observation, where a few days later she delivered herself of a five months' fetus. The placenta not coming away satisfactorily, she was narcotized, the placenta removed and the uterine cavity thoroughly explored. With the hand in the uterus a fibroid was palpable, which projected into the cavity of the uterus, undoubtdly causing the premature labor. It was hoped that with the subinvolution of the uterus the tumor would return to its previously quiescent state. Instead of that the patient kept on flowing.

Operation.—Seven weeks later, on account of severe metrorrhagia and anemia, the patient was operated on and a panhysterectomy performed. On opening the specimen it was found that the uterus had involuted perfectly but that the tumor extended clear through the uterine wall and projected into the cavity of the organ, causing the persistent metrorrhagia.

Here we have a dormant tumor awakening into activity by the conception, and by its rapid growth causing a premature labor and also bringing about symptoms that called for hysterectomy.

While there is a distinct relation between sterility and fibroids of the uterus, the underlying cause of this relation is not known. There are cases of pregnancy on record in uteri that apparently were hopelessly destroyed by myomatous tumors. Under what conditions does pregnancy occur in organs so overwhelmingly damaged by fibroids?

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A most interesting case of this kind was reported by Dr. I. S. Stone[4] at a meeting of the Washington Obstetrical Society. The tumor consisted of a large mass of myomata of varying sizes, which he had removed from a woman six weeks pregnant. The uterus was entirely hidden from view by the surrounding nodular masses. The patient was 30 years old and had been married less than six months. She had been subjected to a conservative myomectomy four years previously. A most difficult and complicated problem confronted the surgeons when the abdomen was opened. The transverse colon was adherent to the growth and all of the omentum was sacrificed in its removal. The adnexa were firmly adherent and hopelessly diseased. The entire uterus was removed save a rim of cervical tissue. The case is one which shows how the most decided changes in the uterus itself, as well as the endometrium, may not prove a hindrance to impregnation.

In regard to adenomyomatous tumors of the uterus, Cullen says[5]:

> The disease is most prevalent between the thirtieth and sixtieth years; it does not in any way tend to sterility. . . . Our experience goes to show that neither an infantile condition of the uterus nor sterility is in any sense a prominent feature with these tumors.

Fibroid tumors may cause sterility by mechanical means. The tumors may distort the uterine canal to such a degree as to obstruct the onward movement of the spermatozoa, or by irritation set up an endometritis, the discharges of which become inimical to the life of the fecundating cell. A tumor may so dislodge the cervix uteri as to make it inaccessible for the semen, hence the sterility. A fibroid, particularly if it is a submucous growth, may keep up a state of congestion of the mucous membrane, this extreme vascularity being unfavorable for the implantation of an impregnated ovum, and hence the sterility.

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4. Stone, I. S.: Am. Jour. Obst., September, 1908, p. 499.
5. Cullen, T. S.: Adenomyoma of the Uterus, 1908, p. 261.

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The cause of benign growths in the uterus not being known, who can say but that the same conditions that are responsible for the fibroids may also cause the sterility? A woman, for example, is fruitful for many years, stops bearing children and develops a tumor. Who can say but that the same factor is responsible for both the tumor and the sterility? Pregnancy is not a simple affair, but the result of a delicate mechanism, and so delicate a mechanism as the fecundation of an ovum must depend on a variety of conditions and not merely on the meeting of the ovum with the sperm cell; hence anything which disturbs this delicate mechanism may be the cause of the sterility. It can not be denied that pregnancy favors the growth of fibroids and that future pregnancies may be interfered with by the greater enlargement of the tumor. We also see cases of conception with fibroids after long periods of sterility.

In considering the subject of sterility, whether the patient is suffering with a tumor or not, there is one thing to be borne in mind, and that is the competency of the male partner. This factor can necessarily never be left out of consideration, and if due attention were given to this subject in every case of sterility with fibroids of the uterus we would find that a large number of these women are sterile because the male partner is incompetent. The competency or incompetency of the male partner has still another bearing on this subject, and that is this: The male partner may be suffering with a sterility due to an obstructive epidymitis from a gonorrheal infection contracted years ago. During the course of marital life the wife suffers a mild gonorrheal infection, which may in turn be the causative factor of the sterility in her, the development of the fibroids in her uterus being incidental and not necessarily the cause of the sterility. In one case of sterility and fibroids one cause may be operative while in other cases the causes may be several. In one case the cause may be a purely mechanical one, while in the other the cause

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may be a physiologic one. Until we shall be able to tell what the cause of fibroid formation is we shall not be able to formulate an opinion as to the relation of fibroids and sterility.

Sterility and fibroids are certainly closely associated, and this close association must necessarily be assumed to exist when it is considered that fibromyomatous tumors are associated with the periods of sexual activity. As Haultain[6] says: "Their growth is practically confined to the years between puberty and menopause, and it is doubtful if they ever originate before or after this period; indeed, if uncomplicated by secondary changes, they cease to grow after the climacteric."

There are no reliable statistics available of large numbers of cases to show what proportion of fruitful women are subject to myomatous growths of the uterus, to indicate how statistics of that character would compare with fibroids in single and sterile women. The subject of fibroids and their relation to sterility under consideration consists really of two parts; one is the subject of sterility itself and the other is fibroids of the uterus. Sterility by itself is a complex subject, little understood, and the same is true of the cause of fibroids.

From a clinical point of view there is a practical side to this question of sterility and fibroids and the manner of behavior of the myomatous tumors toward the pregnant uterus. Clinical experience has shown that the pregnant uterus, under certain conditions, is tolerant toward the fibroid growth. In these clinically favorable cases neither the pregnant organ itself nor the progress of the pregnancy is in any way harmfully affected by the growths in the uterus. With this evidence at hand we certainly are permitted to infer that fibroids of the uterus, under certain not clearly understood conditions, are not harmful to the pregnancy, to the fetus or to the patient herself. This being the case, we can

6. Haultain: In Allbutt and Playfair's System of Gynecology, p. 562.

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deduce the practical lesson not to disturb myomatous growths during pregnancy unless there is clinical evidence at hand to show that the pregnant organ has become intolerant to the tumors in its walls. The size of the growth, or its situation, does not necessarily determine the tolerance or intolerance of the pregnant organ toward the tumors, but the size and situation are of great moment, so far as the future labor is concerned. The size of the tumor, and its situation as well, become important factors at the time of the labor on account of the possibilities of the tumor causing difficulties during the delivery in the form of mechanical obstruction.

Right here a practical question may be asked. What type of tumors should be attacked surgically during pregnancy? The teaching is that a tumor should be removed if pedunculated, excessively movable, greatly enlarged, or so situated as to cause mechanical obstruction during the coming labor. Surgical procedures are justifiable under these conditions even if the uterus is tolerant to the tumor in its walls. Pedunculated fibroids are removed because they are subject to twisting during pregnancy; they are also subject to degeneration during the process of subinvolution of the uterus.

To judge properly what fibroids will cause mechanical obstruction during labor is a difficult task. Cases are on record in which competent observers considered the situation of the tumors dangerous and undoubtedly liable to cause obstruction during labor, but in which under the test of labor the patients delivered themselves spontaneously or with the aid of low forceps operation. We must be constantly on guard in giving positive opinions on this question of obstructed labor by low-implanted fibroid tumors of the uterus. These low-implanted tumors become lifted out of the true pelvis during the progressive enlargement of the uterus, during the pregnancy, and when labor sets in very little if any mechanical obstruction is encountered.

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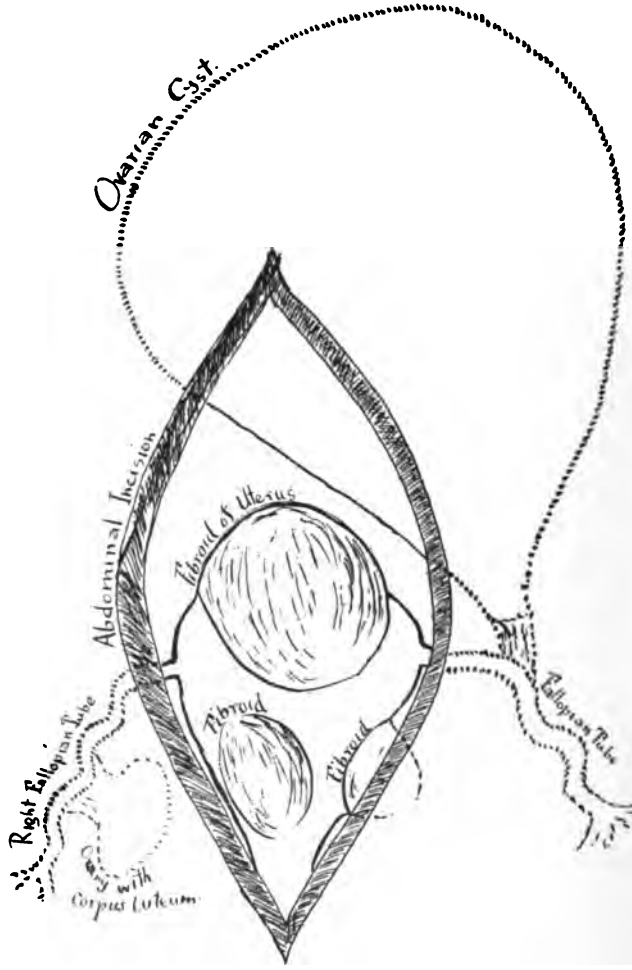
What is the present teaching as regards the so-called interstitial fibroids and operative interventions during pregnancy? Clinical histories have established the fact



Fibroids of gravid uterus, and ovarian cyst.

that interstitial fibroids are of the type of tumors that cause miscarriages most frequently, and yet tumors of this type, when enucleated during operation, will cause the greatest number of abortions, because the pregnant

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organ suffers the greatest amount of traumatism during the removal of these deep-seated tumors. In view of these facts it becomes an important question what is best for a physician to do when called on to manage these cases. Each case of this type must be treated on its own merits. If the pregnant uterus seems intolerant to the presence of the tumor, which should be shown by periodic more or less severe uterine contractions, then an operation should be seriously considered, because with symptoms so marked a miscarriage is impending and a myomectomy may jeopardize the pregnancy to a less extent than the persistent uterine contraction.

The submucous fibroids are the type of tumors that cause sterility most frequently. This sterility is due not so much to the tumors themselves as to the congestion to the mucous membrane of the uterus, which their presence engenders and maintains. Once conception occurs in uteri with submucous fibroids the surgical attitude toward these tumors in pregnancy is the same as in the interstitial type of fibroids.

In the multiple fibroids of the uterus pregnancy has proved to be a dangerous complication. Clinical evidences are at hand showing that under those conditions abortions occur frequently, and great difficulty is at times experienced in properly emptying the cavity of the uterus of the product of the conception. Septic infections are frequently encountered in these cases, and gangrene of the tumors is not an infrequent complication, calling for total hysterectomy to save the life of the patient.

In the case the history of which I shall presently relate several interesting points arose previous to the operation.

1. The patient was suffering with an ovarian cyst which twisted on its pedicle, causing acute symptoms.

2. There were several fibroid nodules to be felt on the uterus.

3. The patient was a primipara, married nine years.

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4. She was extremely anxious for a child.

5. For a week or ten days previous to the onset of the acute symptoms the patient had very definite and frequent contraction pains of the uterus, permitting the interpretation of the symptoms that a miscarriage was impending.

When the necessity arose for an operation the question was asked, what would be the best thing to do in this particular case, in view of the definite symptoms present numerated above. Should the offending neoplasm, the twisted ovarian cyst, alone be removed and the fibroids be left undisturbed for fear of inviting a miscarriage, or should the entire surgical field be simultaneously attacked? I felt that in this particular case I had no right to ignore the symptoms that pointed to a tendency on the part of the uterus to empty itself, and so a myomectomy was also performed. The question may be asked, given a case of early pregnancy, with several small fibroids in the uterus that the pregnant organ kindly tolerates, if an ovarian cystoma be present at the same time, whether it would not be good surgery to remove the offending cyst alone and leave the fibroids undisturbed. It seems to me that such a procedure would be perfectly justifiable, since we know that gravid uteri are frequently most tolerant to myomatous growths.

The history of the case is as follows:

CASE 2.—*History.*—Mrs. H., aged 37, was seen on Aug. 9, 1907. She was brought to the hospital in a carriage, having fainted on the street. She was complaining of pain in the abdomen, which came on very suddenly, causing vomiting and fainting, resulting in a collapse on the street. The pain was sharp, cramp-like in character, excruciating at first; it gradually subsided and when I saw her about two hours after the attack her abdomen was simply tender but no pain was present. For a week or ten days before this attack the patient had not been entirely well, having suffered with cramp-like pain in the abdomen, moderate fever, indigestion, and an uncomfortable feeling in the bladder. The cramp-like pain of a bearing-down character, lasting for a short period, would let up only to reappear again at short intervals. She had been married

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nine years but never had been pregnant; the cause of the sterility was not known. Her menstruation was always normal, of the four-weekly type, moderate in amount, lasting from three to four days. Her last menstruation, on July 28, had been very scanty, almost none. She did not know if she were pregnant or not, having had some slight morning nausea and the scant menstruation at the last period. Family and previous history negative.

Examination.—The general condition of the patient was good. Heart and lungs normal; abdomen was not enlarged but was tender to the touch. Bimanual examination revealed a slightly enlarged uterus with several fibroidal nodules on its surface. A large movable tumor was also present in the pelvis. The diagnosis was ovarian cyst, with twisting of pedicle, fibroid of the uterus and pregnancy. On account of the extreme movability of the pelvic tumor it was thought that the attack of pain was due to the twisting of the tumor on its pedicle.

The patient was advised to submit to an operation for the removal of the tumor and for a myomectomy. The patient and the family were very anxious for offspring.

Operation.—After careful preparation the patient was operated on Aug. 13, 1907. The abdomen was opened in the median line, the pedicle of the cyst was tied off and removed. There were three fibroids in the uterus varying from the size of a walnut to that of a lemon, the larger one of the tumors extending deep into the uterine wall. The tumors were removed by shelling them out of their beds and the uterus was closed with interrupted catgut sutures. In some places the bleeding from the uterine wall was quite free, necessitating very careful suture appplication. The ovarian tumor was on the left side. The right ovary was enlarged considerably and a corpus luteum of pregnancy was plainly visible. The abdomen was closed in layers and the patient put to bed in a very good condition.

Postoperative History.—The patient regained consciousness with very little, if any, nausea. She vomited a few times. She returned from the operating-room at 10:30 a. m. and at 4:30 p. m. a bright, bloody flow from the vagina was noticed. Morphin was administered hypodermically to relieve pain and to quiet uterine contractions. The patient was allowed to take water freely. Twenty-four hours later the bloody flow had diminished considerably but it was still bright red in color. Fifty-two hours later all bloody discharge had stopped. The bowels moved thirty-six hours after the operation. Some vaginal discharge reappeared again but this was from some blood that remained in the vagina, as it disappeared on administra-

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tion of a douche. The abdominal wound healed by first intention; an entirely afebrile recovery took place. The patient sat up in two weeks and left the hospital in the fourth week. Two months after the operation the patient removed to Canada, where she placed herself under the care of a physician, who wrote to me that the patient was making a very satisfactory progress with her pregnancy and no abnormal or untoward symptoms had appeared as a result of the operation. On April 4, 1908, she was delivered of a nine-pound baby. Her labor pains started at 5 p. m. and the baby was born with forceps at 11 p. m. In other words, it was practically a normal delivery.

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ABSTRACT OF DISCUSSION

Dr. Howard A. Kelly, Baltimore: We are very much at variance in different parts of the country or even in the cities in regard to methods. I am glad that Dr. Grad spoke of the growing tendency to non-interference. I am constantly sending these patients back home without doing that which was expected when they came to me. When the tumor is in the upper part of the pelvis I habitually leave it alone, unless it is producing marked symptoms, and I do not recall any case now within some years that has been producing symptoms requiring interference. I am glad also that he referred to the fact that there were tumors which though low down might get high enough up not to obstruct delivery. When a tumor is low down it is a good practice to put the patient under a little gentle anesthetic and see if it can be pushed up. The chances are then favorable for delivery at term. Even when it is down in the cervical portion the patient may go to term, although when the tumor is large I do not think it is wise to wait for delivery *per via naturales*. I have had a case of this kind within a year; a large, stout woman was delivered with great difficulty of a large size child which lived. Shortly after she was sent to me with an enormous tumor blocking the cervix. Had she come to me at the end of pregnancy and I had found that tumor there I would have said that delivery was impossible. Yet the tumor was slipped up and with great difficulty and with considerable risk to life the child was born. In a case like that of Dr. Grad I would have opened the abdomen and taken out the tumor. I have a number of myomectomies in pregnancy to my credit, successful ones, but I prefer not to interfere, but to let them alone and to wait.

Dr. Henry D. Fry, Washington, D. C.: Dr. Grad has spoken of these tumors which are frequently low down in the pelvis during pregnancy and as a result of pregnancy, the growth of the uterus and contractions of the muscular fibers are drawn up out of the pelvic cavity so that delivery through the

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natural passages would be possible. When there is a pedical the tumor can be pushed up, but even in the interstitial form of fibroid, low down blocking the pelvis, I have seen them frequently rise up in the later months of gestation and get above the brim and the woman give birth to her child naturally. On two occasions I have had to do a Porro operation when the fibroid was projecting down in the vagina and when on examination it seemed as if the fetal head were in the pelvis. There was a large round solid mass projecting down and when I operated I thought that I would have to do a panhysterectomy but I found the cervix was pushed away up above the symphysis pubes that the tumor had grown down from behind by a pedicle and was blocking the passage. One danger of leaving these fibroids alone, even when high up in the uterine wall, is the occurrence of suppuration after childbirth. I have had three cases of this kind. One patient was sent to me by Reynolds of Boston, five months pregnant. I intended to let her go until near term and do a Porro operation. However labor commenced unexpectedly with strong pains. When I reached the house the cervix was dilated to the size of a silver half dollar. She was brought to my hospital as quickly as possible. The pains continued until there was almost complete dilatation of the cervix. The labor had progressed so far that I had abandoned the plan of the Porro operation and permitted her to have her child by the natural passages. She did well for five or six days. She then went into collapse, had a high fever and was not in condition at any time afterward when I could do an operation. I knew that necrosis had occurred but she was in such a desperate condition I did not dare to operate. Autopsy showed a fibroid much suppurated. There had been rupture into the peritoneal cavity with suppurative peritonitis. In another case I did a hysterectomy, the woman recovered, and in cutting on the fibroid I found a large abscess. In another patient sent in very recently the tumor was not large. At about the eighth month of pregnancy she had a discharge with a disagreeable odor, and labor pains set in followed by premature delivery of an infant. After delivery I saw her at about the fifth day. She still had this discharge and was in bad condition. Her pulse was 32, very weak and she had septic fever. At the fundus of the uterus could be felt the suppurating necrotic fibroid projecting down from the fundus in the cavity of the uterus. She was in too desperate a condition for operation and we let her alone, watching and stimulating her and she recovered. So I think that when we decide to let these women with fibroids have their babies we must watch them very carefully during the puerperium and on the first sign of fever which we suspect is due to suppuration in the tumor we must operate at once.

Dr. A. E. Benjamin, Minneapolis: It has been my experience to have a number of these cases degenerate during the

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time they were in interstitial stage. In one patient sent to me after delivery I found the fibroid so wedged down and adherent that it was almost impossible to get that growth out of the pelvis. I never worked so hard in any case to get the tumor out. Another patient was a physician's wife who had had three miscarriages. She came to me at the sixth month of pregnancy and was beginning to have pain and some fever. She was in bed. I told the husband that she should be operated on. I neucleated a fibroid the size of a lemon about half way down the fundus of the uterus. She had a living child born in due time. Examination showed the tumor to be diseased in the center. This has been the case with a number examined. I feel that a certain percentage of these patients should be operated on. By careful manipulation operating on the growth itself, it is not necessary to produce abortion.

Dr. J. H. Carstens, Detroit: There are many sides to this subject. Last fall I reported cases that I had collected from all over the world—about 550—and if you look those cases over you will find the mortality is very low and that the operative mortality during pregnancy is not greater than in women not pregnant. All these patients were operated on by abdominal section without any trouble. These women could not be delivered otherwise. I have seen women who died undelivered. I had one patient, in whom I had to remove the uterus containing any number of fibroid tumors, who was delivered normally. The fibroids and the uterus were contracted so firmly, however, that it was impossible to deliver the placenta which became decomposed and the woman was septic in the highest degree and I had to operate on her four days after delivery. All these cases occur and it seems to me we can not lay down any definite rule. If a woman is pregnant and has a fibroid or any kind of tumor I think she is in a serious contion and her mental condition is not of the quietest. So we ought to consider seriously whether such patients should be operated on or not. I think a good many require operation during pregnancy and will stand it just as well as at any other time without producing abortion. In these 550 cases it was perfectly astonishing how many women went to full term after myomectomy. These records from all over the world have convinced me that myomectomy during pregnancy is not a serious operation and that furthermore nearly all the women will go to term and will save their children just as well.

Dr. H. Grad, New York City: In this case myomectomy was done because the patient presented definite symptoms of uterine intolerance toward the fibroids in its walls. She had uterine contractions which were very painful and on that account myomectomy was done after the ovarian cyst was removed. Had she had no symptoms I think I would have been tempted to leave the fibroids, and she probably would have gone on to full term as she did.

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THE TREATMENT OF CANCER OF THE UTERUS WHEN TOO FAR ADVANCED FOR CURE BY EXTIRPATION OF THE UTERUS

H. J. BOLDT
NEW YORK

Although my primary purpose is to speak of the treatment of inoperable cancer of the uterus, a few words regarding the general subject of uterine cancer may not be out of place.

Most important in this connection, it seems to me, would be the formulation of some plan whereby the number of women hopelessly so afflicted may be lessened. This can be accomplished only by teaching women that there is no one symptom peculiar to cancer alone. While it is true that the disease is more likely to occur about the climacteric period, yet no period of life is exempt from it. Its approach is so insidious that, when symptoms of an alarming nature manifest themselves, the disease is usually so far advanced that it comes under the head of "inoperable cancer." Women must be taught to apply to their physicians on the first manifestation of a pelvic symptom at variance, even though very slightly, with their normal condition; in particular a variation of the menstrual function, including a leucorrheal discharge, and especially if their age be past 40 years; though, let me reiterate, they must be made to realize that no age is exempt from uterine cancer.

In Germany women have been taught by Duehrssen and Winter, especially by the latter, the necessity of early consultation with their physician, when any ab-

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normal symptom presents itself. The teaching by Winter has been through the lay press, with the result that already in many parts of Germany there is a decreased percentage of "inoperable cancer" patients. Physicians, too, have learned the necessity of carefully examining every patient that applies to them with such symptoms, and the wisdom of expert consultation whenever there is question as to the diagnosis. The American conception of what is ethical is somewhat at variance with that of Germany; yet similar methods must be adopted here if we are to gain early practical results. It is for such men as those composing this Section to determine on the best means of diffusing information among women without violating the standard of ethics, and I would earnestly suggest that a committee be appointed to consider this important matter and report its conclusions, with a view to letting the main body of the Association take such action as may be most useful to womankind, and at the same time strictly ethical.

I am convinced that only by such means can we hope to lessen the mortality from cancer of the uterus, and that the early recognition of the disease, followed by prompt proper intervention—not the very extensive abdominal operations now practiced by many, particularly in Germany—will prove an important agency in decreasing the death rate from this malady.

Since the revival of the abdominal route for the extirpation of cancerous uteri, and the employment of the modified paravaginal section for extirpation by the vaginal route, the number of patients left to die of the disease without any surgical attempt to effect a cure has been lessened. Nevertheless there are still a large number of women for whom nothing can be done, save some palliative treatment.

It is unfortunate that women with inoperable uterine cancer should be undesirable patients at most hospitals, for proper hospital care is fully as necessary to these unfortunates as to those still in a condition permitting

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of an attempt at radical removal of the disease by surgical intervention. It is, indeed, pitiful to see how little is done to mitigate the misery of these sufferers; how frequently every shadow of hope is taken from them by some unfeeling person—very often the physician—who does not withhold the truth as to their condition.

The palliative treatment of cancer becomes especially important when we recall that, by preventing the nutrition of the cancer cells, we cause them to undergo retrograde metamorphosis and thus destroy their activity. We know from the experience of the late John Byrne and many others, myself among them, that even in carcinomatous uteri of long standing the further progress of the disease may be checked by proper heat application. It has been asserted by some, particularly by Byrne, that cures even have been brought about by such means, the cancer cell having very little power of resistance against heat. The late Lawson Tait asserted that he had seen some spontaneous cures of cancer. I myself saw such an instance: a pathologist of international repute had made the positive diagnosis of cancer, and so far as the macroscopic appearance of the tumor went, his opinion seemed correct. When a few years later the woman died of some ailment of a different nature, the postmortem failed to show evidence of the tumor found by me at the time of making the abdominal section. The carcinomatous structure had disappeared. That observation, personally made, would have a tendency to verify the statement of Lawton Tait, that an exploratory abdominal section, in some instances, suffices to bring about a cure of intra-abdominal cancer. In addition to the case verified by the report of a prominent pathologist, I saw another tumor, which, from its macroscopic appearance and from the clinical course of the patient prior to the doing of the abdominal section, was likewise an inoperable cancer. Not only I, but Drs. John Wyeth and Sims, who were present at the time the exploration was made, thought

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that the tumor, for the purposed extirpation of which the exploration was made, was a carcinoma. The abdomen was closed, and then, for more than ten years, I observed the woman. The tumor gradually disappeared, and three years later not a vestige of it could be felt. Moreover, the woman, who was emaciated at the time of operation, became robust, the picture of health, without further treatment. The family had been told, after the exploratory operation, that the patient would probably die within a year from the cancer which, even before the abdomen was opened, was thought to be present. Inasmuch as no histologic report from an excised piece of the neoplasm was obtained in this instance the clinical diagnosis lacks confirmation by the microscope. There can be no question, however, that the system, under some circumstances, checks the proliferation of cancer cells and occasionally destroys their life.

Czerny[1] reports an instance of "inoperable" cancer of the vaginal part of the cervix, for which a palliative operation was done. Re-examination of the patient, five years and three months later, showed her to be absolutely cured. He mentions several other instances of spontaneous cure of cancer.

Lomer,[2] of Hamburg, in his article on the curability of carcinoma, also quotes cases of similar cure.

Chrobak[3] has observed a number of patients on whom palliative operations were done, with entire recovery following.

It seems certain that small cancer remnants left in the body are sometimes taken care of by the system. What the conditions are in such instances no one has yet determined. An example illustrating this was the case of an incipient cancer of the tongue, for which I operated in association with the late William T. Bull

1. Czerny: Unerwartete Krebsheilungen, Ztschr. f. Krebsforsch., v, 28.
2. Lomer, R.: Zur Frage der Heilbarkeit des Carcinoms, Ztschr. f. Geburtsh. u. Gynäk., 1903, l, 305-384.
3. Chrobak, R.: Zur Behandlung des inoperablen Uteruskarzinoms Wiener klin. Wchnschr., 1905, No. 38.

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in 1888, when I was still doing general surgery. The clinical diagnosis was verified by the microscope, and it seemed later from the macroscopic appearance of the tongue, and also from a microscopic examination from the edges of the specimen removed, that a small remnant was left behind; yet the patient eventually made a good recovery, and five years later was living without evidence of the disease.

Clinical experience has shown beyond doubt that palliative treatment may benefit cancer patients by directly destroying the cancer cells with the agent used, and perhaps by forming a protection against the cancer proliferation.

As to palliative treatment by surgical means, the disease in some instances has advanced too far even to allow such a course to be considered, because its application might—yes, in all probability would—leave the patient in a worse condition than before the intervention. We know that in young persons especially the neoplasms grow rapidly, so that the nutrition of the tumor does not keep pace with its rapid growth. The result is that the central part of the tumor breaks down because of the sparsity of blood vessels there. Hence the destruction may have proceeded so far as to make it hazardous for us to use proper energetic surgical means to correct the symptoms caused by the breaking down of the new growth, because of the danger of injury to the bladder or the rectum.

Some surgeons have gone so far as to assert that a refusal to do a radical operation for cancer of the uterus is justifiable only after an exploratory abdominal section has shown it to be impossible, except in those cases in which it is obvious that the bladder or the rectum is already affected. I confess that I consider this going too far, for, while we may still be able to complete the operation, I can not conceive what the patient is to gain, even if she does recover primarily. I look on an operation simply as a surgical possibility when uterine

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cancer has passed beyond the boundaries of the uterus to such an extent that palpation can readily show that it has done so. I prefer to resort to a palliative operation with a curette and a cautery under such circumstances, and I believe that the results are just as satisfactory as to the longevity of the patient, and far better as to immediate mortality; for the curette and cautery operation should cause no deaths directly, unless from the anesthetic.

Before beginning the surgical intervention with a curette and a cautery, a careful examination is essential to determine, as nearly as possible, to what extent the neoplasm has progressed. For this purpose a cystoscopic examination of the bladder is important. If the mucosa be found very edematous, or other evidence of inflammation be present, it is obvious that the neoplasm is approaching the bladder, and one must then be very careful in one's subsequent work. If the vagina be extensively infiltrated by the cancerous growth, it is inadvisable to do anything with the curette and the cautery.

I have had a specially heavy curette constructed for doing the scraping as expeditiously as possible. I have named it the "cancer spoon" to distinguish it from the smaller forms of spoons and curettes generally in use. Such a large instrument has an additional advantage; one is not so likely to perforate into the peritoneal cavity as with the ordinary small curette. All readily breaking-down structure is rapidly excavated with the spoon. The bleeding is stopped with an extra large dome-point electrode of a galvanocautery, so that it can be done more rapidly. To avoid burning the vulva and the vagina, I devised a speculum a few years ago which is constructed of metal and has a double hull, cooled by a continuous flow of cold water through the dividing space. In shape it is like the old style Ferguson speculum. The burning or charring is done very thoroughly, so as to leave practically only an outer shell

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of the uterus. The operation must be controlled by frequent examinations with the finger, lest we perforate the uterus and injure other structures. This has happened with me but once when using the cautery, though it occurred several times while doing the excavating with the style of spoons and curettes generally used.

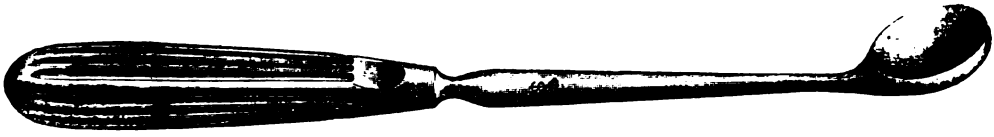

Fig. 1.—Heavy curette or "cancer spoon" for scraping a carcinomatous uterus.

On these occasions I immediately ceased the operation, and no harm resulted. With the large spoon now used by me I have never broken through the uterus. It is well, now and then, to cool off the cavity which is being

Fig. 2.—Metal speculum with double hull, for use in cauterizing the uterus.

charred. This is easily done by putting ice shavings, or very small pieces of cracked ice, through the speculum, leaving them for a few minutes and then drying the surface before again applying the heat. Before the cooling speculum was devised I used vaginal retractors,

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wrapped with gauze wrung out in ice-water; yet this did not prevent occasional burns. With the cooling speculum, burns are entirely obviated.

After the eschar has been thrown off, it is best to use strong tincture of iodin in the cavity once every second day until the cavity has contracted. Or, judging from Gellhorn's experience with acetone, that remedy might be used with even greater benefit to the patient following the casting off of the eschar. Once I saw a fatal secondary result from the treatment. After the eschar was thrown off, a branch of the uterine artery began to bleed. I was called to see the woman in the middle of the night. The artery could be seen spurting. The cavity was tightly tamponed, but this did not stop the bleeding. By the time I saw the woman again, after returning home and preparing myself more energetically to control the hemorrhage, she had lost so much blood that she died of acute anemia. While it is asserted that patients have been cured by such treatment, I can not verify such results among patients observed by myself. I have seen, however, a number of patients whose lives were prolonged three years and more, and who were made comfortable for that period. It has been my custom to repeat the cauterization whenever necessary; i. e., when even a little bleeding showed itself, or if there was evidence of softening of the diseased uterine structure. I have recauterized some patients six times, and oftener, during a period of from three to four years.

A Paquelin cautery, a galvanocautery put in operation by a battery, or the old style "hot iron," are not so serviceable for this work as is the heating of the electrodes by the direct, or by the alternating current supplied for lighting purposes. I know of no method of treatment that will control the two symptoms, bleeding and offensive discharge, so satisfactorily as that of excavation and cautery.

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The late Marion Sims used strong chlorid of zinc solution for this purpose. The objection to this procedure is that one can not know in advance how deep the destructive process of concentrated solutions of chlorid of zinc may go. In one instance that I have observed it went to such depth that the slough caused both a vesicovaginal fistula and a fecal fistula. It has been asserted that deep destructive action can be avoided by not allowing the tampon which is impregnated with the solution to remain for more than a day, or even for so long. I have found it very difficult to remove such a tampon until it has become loosened by the chlorid of zinc slough being ready to be cast off spontaneously. Indeed, I have found it impossible without causing so much traumatism to the underlying tissue that profuse bleeding must result. More important, however, is the question: If the full action of the medicament is not taken advantage of, why use it at all? Furthermore, despite the precautions that one may take by employing bicarbonate of soda, according to the directions laid down by Sims, I have never seen an instance in which the cauterizing effects of the zinc did not occur on parts other than those for which it was intended, and particularly in the vagina.

Carbid of calcium was also used on a number of patients many years ago, but, like other agents of supposed curative value, it proved a complete failure in my hands. Moreover, its caustic action is fully as intense on parts where it is not desired as is that of strong chlorid of zinc solution; and I know of no way to prevent this.

Several years ago, when the treatment of inoperable cancer with pyoktanin became known, through the late Mosetig-Moorhof, I used this remedy very extensively, and believed that, in some cases, I observed good results. A continuance of the observations made, however, proved my conclusions fallacious. Undoubtedly now

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and then a patient is benefited by the injections into the tumor, so far as the local condition is concerned, but the improvement is not permanent. This applies also to the injections with absolute alcohol, for which, for a short time, extravagant claims were made.

Some surgeons assert that the chemical destruction of the new growth is far superior to the destruction by means of a curette and cautery. I have made painstaking studies on this point, and am of the opinion that, if a patient is still in a condition for the application of such direct surgical methods as the curette and cautery operation, they afford the best palliative means at our disposal.

After cauterization has been completed, nothing further is necessary until the eschar begins to slough and excretions from the wound begin. Then the treatment with tincture of iodin, or with acetone, as advocated by Dr. Gellhorn, should be begun. After applying the iodin, it is best to put a tampon of absorbent cotton or sterile gauze into the cavity, so as to get it dry after treatment. The use of vaginal douches, so frequently employed to overcome discharge and to keep the patient clean, should be prohibited.

Gellhorn, of St. Louis, has published an article[4] which seems to be of value. He utilized the laboratory observations of the effect of acetone in a practical way on cancer of the uterus. He claims for it that it hardens the tissues. His method is as follows:

The new growth should be excavated as thoroughly as possible, and then the acetone applied through a Ferguson speculum. The pelvis should be elevated and the solution poured into the speculum. Care should be taken not to allow the acetone to come in contact with the external genitals. The surplus of acetone, after the remedy has remained in contact with the raw surface

4. Gellhorn, George: A New Mode of Treatment for Inoperable Cancer of the Uterus by Means of Acetone, THE JOURNAL A. M. A., 1907, xlviii, 1400.

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for from fifteen to thirty minutes should be absorbed with cotton. The treatment should be repeated every two or three days. Gellhorn maintains that this invariably relieves the patients of the main symptoms.

An analysis of the results with trypsin treatment does not seem to me to make it desirable to give trypsin a prominent place.

Fulguration is one of the latest therapeutic agents employed in the treatment of cancer. Czerny[5] asserts that if all the carcinomatous structure can be made accessible to fulguration the cancer may be cured, because fulguration does destroy the cancer cells. The "dose" of fulguration may be administered with exactness, and the treatment by the method is elective. With the patient under the influence of narcosis, fulguration may be applied for an hour, then the exposed cancer area may be excavated, and the wound surface again fulgurated for from ten to fifteen minutes. Wonderful therapeutic results are claimed for the treatment, which was first described by Keating Hart, of Marseilles.

As with all new remedies, one is apt to become overenthusiastic; I have so often been compelled to recede from an expressed opinion that I now believe it safer to test a remedy thoroughly before endorsing it.

This much we may say from accumulated experience: If in young persons with cancer beginning in the cervical canal the disease has perceptibly progressed beyond the line of so-called operability, life is not long to be enjoyed, no matter which of the palliative forms of treatment at present known to us is employed.

It may be that in the future a valuable therapeutic agent will be found in the ferments, judging from the results obtained by the injection of placenta ferment; but at present it is too early to be sanguine. This is said because we have been disappointed in every in-

5. Czerny: Ueber die Blitzbehandlung der Krebse, München med. Wchnschr., Feb. 11, 1908.

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stance in which we were led to hope, from the claims made, that we had at last in our possession a remedy that would cure cancer of the uterus. I call attention only to a few of the more prominent ones: the Roentgen rays, radium, trypsin, etc.

The work of Professor Bier[6] is exceedingly interesting. Bier began his experiments—the injection of blood of a different species into malignant tumors—and published his investigations[7] in 1901. His object was to cause an artificial inflammation with an elevation of temperature and thus demonstrate that inflammation and fever were associated, especially so far as concerned the chemical process. He selected defibrinated blood from swine for his experiments, because hog's blood causes, when injected into cancerous, or into sarcomatous tumors, decided local and general manifestations. When 10 to 20 c.c. of such blood are subcutaneously injected, invariably, after the lapse of several hours, an inflammation is caused at the point of injection. This attains its maximum degree of severity in from one to three days. Then it gradually subsides. On repetition of the injection with such different blood the reaction is caused by a smaller quantity.

From lamb's blood, used by Bier in other diseases, a much milder reaction resulted. Never having observed any permanent ill effects from such injections, he believes them the safest method of producing fever and local inflammation. While the defibrinated blood does not contain leucocytes, these are supplied in abundance by the body of the recipient of the blood. Such blood does not seem to have any influence on normal tissues.

The action of the blood on tumors varies. Almost invariably, in suppurating carcinomata, the secretions are diminished. On existing pain, caused by the tumor,

6. Bier, August: Beeinflussung bösartiger Geschwülste durch Einspritzung von artfremden Blut, Deutsch. med. Wchnschr., 1907, No. 29, 1161.

7. München. med. Wchnschr., 1901, No. 15.

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it does not seem to have marked influence. The growth of carcinomatous neoplasms is not noticeably influenced. The experiments are still being continued.

Though we know that women with inoperable carcinoma of the uterus have been kept alive for many years, apparently entirely cured, we can not be absolutely certain that there are not within the body some remaining cancer cells with latent avidity. I believe the recurrences after five years and more that have been reported from time to time may thus be explained. In other instances, it is likely that the diagnosis of carcinoma lacked verification under the microscope by a competent pathologist. To my personal knowledge, several such patients have been reported as cured by palliative treatment.

The pain that is caused by pressure of the tumor on nerves must be combated with narcotics. Of these, opium and its alkaloids are the only ones that give entire satisfaction. A number of substitutes have been proposed, with the assertion that they act equally well or even better; but none of them has stood the test. I do not hesitate to confess that I am an advocate of euthanasia in the case of such patients, if the giving of relief from pain by the administration of remedies that we are sure will give such relief can be so called. One should begin with as small a dose of morphin as is sufficient to relieve a patient, and then not repeat it oftener than necessary. The dose must be increased later, and the intervals of administration shortened. I have had patients who required five grains of morphin at intervals of from three to four hours in the last stages of the disease, if they were not more or less uremic.

In summing up, allow me to repeat that we must formulate a plan whereby we can teach women, not singly here and there, but in the mass, and in an ethical way, the insidiousness of the onset of cancer of the

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uterus; the necessity of consulting a physician on the first manifestation of any abnormal pelvic symptom; and the fallacy of the view that cancer occurs only at the climacteric period.

Physicians must accept the responsibility of letting no question in diagnosis remain unanswered. If they can not themselves make a positive diagnosis, they should ask aid of those who can.

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THE PALLIATIVE TREATMENT OF CANCER OF THE UTERUS ESPECIALLY WITH THE THERMOCAUTERY

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BROOKLYN

As a preliminary to this paper I wish to state, in the most unequivocal terms, that the palliative treatment herein recommended is not advocated as a substitute for the early extirpation of the diseased structures by appropriate surgical procedure, but that it is applicable to cases in which the time has passed for such treatment, and also in certain cases in which the consent of the patient can not be obtained for early hysterectomy, who will accept a cautery operation as an alternative; neither is it my purpose to inquire into the etiology of the disease or review the literature of the subject, but to study it chiefly from the clinical point of view, with the reference to the one topic of palliation.

The prophylaxis of smallpox by vaccination, the curability of diphtheria by antitoxin, the relief of epidemic cerebrospinal meningitis by Flexner's serum, and the cure of certain cases of septicemia by antistreptococcus serum, have marked epochs in medical progress. Just at present the professional mind is focused on the preventability and curability of tuberculosis, with results which must count for a lessened mortality and increase in average longevity, with a corresponding freedom from avoidable invalidism and suffering.

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The advocates of preventive medicine are engaged, in no small measure, in the efforts to discover the cause and cure of cancer; but the cause has so far escaped observation; and it is painfully evident that early radical measures have about reached the limit of their curative efficiency. It must be apparent, however, to the scientific and humane practitioner that the palliative treatment of uterine cancer is not receiving that attention which the subject demands, and it is to this aspect of the problem to which I ask your considerate hearing.

In 1903 I presented a paper on this subject to the American Association of Obstetricians and Gynecologists, while on previous and subsequent occasions I have called the attention of the profession to the appropriate treatment of these most unfortunate and neglected patients, and in what I shall say on this occasion I shall quote freely from that paper.

I count myself fortunate in presenting this topic for your consideration to-day, not alone from the distinguished character of this representative body, but for the larger opportunity it affords of reaching so great a number of the medical profession, in the hope that these suggestions will stimulate a renewed effort for the relief of a large class of unfortunate sufferers.

What I have to say will treat more of cancer of the cervix than of cancer of the body of the uterus, though in principle it applies to both. The specific indications for treatment will depend on the local involvement and the extent of tissue destruction; the end to be attained is to get rid of all diseased structures possible. When the disease has passed beyond the cervix, involving the bladder, the broad ligaments, and adjacent structures, it may be advisable to limit the treatment to the superficial area of ulceration. The cautery or caustic applications which result in opening into the bladder or rectum or which involve the pelvic viscera are to be avoided. The important problem is usually the exercise of that

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judgment which decides the conservative limit of approach and that skill which renders such effort availing.

After long personal observation and experience, I am convinced that no palliative treatment is at once so simple and effective as the thermocautery; and one advantage it has over all other methods resides in the fact that it effectively closes the lymphatic vessels, as is noticed in thermocautery operations elsewhere, notably in operations for hemorrhoids.

A well-equipped galvanocautery plant for hospital work leaves nothing to be desired; and as between a portable galvanocautery apparatus and a Paquelin cautery for non-hospital cases circumstance will decide. Those who attempt the operation with one apparatus will not infrequently regret another had not been supplied. Whether the superiority of the thermocautery over caustics is due to the influence of heat on the diseased cells beyond the area of cell destruction is a matter of opinion, but, in view of the better clinical results of the former, the deduction suggested is altogether logical and probable. To meet the varying indications a variety of platinum knives and electrodes are necessary.

I desire to give special emphasis to the fact that it is quite exceptional for the patient to suffer pain after the use of the thermocautery, provided, however, the mucocutaneous surfaces are not seared or burned. This requires tact and experience. I have usually found it easy to protect the vaginal surfaces from the injurious heat of the cautery by the use of strips of asbestos paper of proper size and shape. Where large areas of ulceration are present the curette may first be used to advantage. This is likely to result in pretty active hemorrhage. This bleeding is usually easily controlled by the application of pledgets of cotton applied with pressure, first dipped in dilute acetic acid, usually of half strength, or by the use of the adrenalin chlorid. After this, the cautery knife is to be applied at a dull red heat until the surfaces are thoroughly charred. The

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after-dressing consists of 5 per cent. iodoform gauze, reapplied daily, after cleaning the parts with liquor cresolis compositus or permanganate solution douches. The use of peroxid of hydrogen is likely to provoke hemorrhage.

To Dr. John Byrne, of Brooklyn, recently deceased, the professions are indebted to an elaboration of the correct use of the galvanocautery. His method of operation in cancer of the cervix was to introduce, well up into the cervical canal, an expanding double tenaculum forceps that when opened held so firmly that any practical degree of traction could be made. A circular fissure, close to the vaginal junction, was then made for the reception of a platinum wire loop. By continued traction while this wire was slowly eating its way through the structures the entire cervix was removed. His next step was to use a sharp curette within the whole area of the uterine cavity. This afforded sufficient space for the introduction of another electrode, having a larger cauterizing surface, going over this entire surface. The cavity was then sponged dry and a tampon soaked in acetic acid and tannin applied, and the parts made dry; after which a dome-shaped cautery instrument brought to a cherry-red heat was slowly applied to this whole area until the parts were completely charred and black. By proper application of this thermocautery nearly the entire uterine structure is destroyed, save a shell of tissue and the peritoneal covering.

It was by his skill and persistency that the efficacy of the galvanocautery was established on a solid basis. The skill in the use of the thermocautery was, first, in not going far beyond the area of involvement, and, second, in having the cautery knife hot enough to burn the structures and not hot enough to disintegrate them too rapidly. If the proper heat is not maintained, troublesome hemorrhage may follow. I have seen patients far advanced with cancer of the cervix and uterine body,

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showing signs of grave systemic infection, who lost their cachectic appearance after thermocautery operations.

The primary objection to the powerful escharotics like mineral acids, caustic potash, etc., is the difficulty, if not the impossibility, of gauging their corrosive action, the pain of which is often atrocious and far greater than that of the thermocautery.

Daily vaginal douches with permanganate of potassium or compound solution of cresol are the best antiseptics. In all manipulations of the parts subsequent to the operation the greatest gentleness should be observed. Generally the use of bivalve speculum should be avoided, as it is likely to impinge on this area. Usually the dressing is best accomplished by having the patient in the Sims position and by using a medium-sized or small Sims speculum. Mention should be made of the utility of oxid of zinc, carbolized, or iodoform gauze. The slough separates usually in from one to two weeks. Daily dressing must be faithfully applied every day until healing follows, or, should it not follow, its use must be continued to keep the parts as aseptic as possible. Where healing is imperfect, and unhealthy granulations reappear, they may be touched with carbolic acid or silver nitrate, pure or diluted as the case may indicate. As in granular surfaces, generally the recognized healing power of silver nitrate must not be forgotten.

In cases in which healing does not follow, or in which the disease returns, the acrid discharge is a prominent factor in the production of pain, and it goes without saying that local cleanliness and disinfection are constantly required.

In hopeless cases this local treatment is a *sine qua non* for the patient's comfort; and it is at this point in the history of many patients that the failure to give relief occurs. It is possible in some instances to train an intelligent nurse to do the dressing, but the skilled hand of the attending physician is most satisfactory. It takes time and patience, but the careful expenditure of both

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gives the largest degree of comfort and the pain is reduced to the minimum. Sometimes the patient experiences much relief from the local use of cocain, frequently repeated. Not infrequently rectal suppositories containing two grains or more of codein and three of extract of hyoscyamus add materially to the relief of the pain. Later on morphin sulphate in increasing doses may be required to minimize suffering. If this is not well borne the deodorized tincture of opium may be substituted. Again I reiterate the necessity of constant cleansing of the parts, by skilled hands, as indispensable to greatest relief from suffering.

I can not speak from the magnitude of experience which Dr. Byrne presented in his paper to the American Gynecological Society several years ago, in which he stated that he had never known a recurrence of the disease at the part from which it had been thus removed, but that it had reappeared in the fundus, ovaries, or some adjacent structure. In this I have not been so fortunate, owing perhaps to technic less perfect than his. By this method in the report referred to Dr. Byrne operated on 367 patients with cancer of the uterus, of whom at the end of five years 19 per cent. were still alive. This is the most remarkable, as he operated in every case which presented itself, without a single primary mortality. Taking this fact into account, his statistics show most remarkable results, for probably the statistics of no other operator include the cases of so-called inoperable cancer.

The conjecture—well founded in regard to some later ones—that statistics are too often a medium for personal exploitation rather than a scientific record of actual events in support of their authors' declarations, can not be entertained by those who knew Dr. Byrne personally, in regard to his statistics, which are open to no such suspicion or doubt, and are entitled to the confidence of the profession.

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There is, it should be mentioned, no reason why in recurrent cases the thermocautery can not be repeatedly applied with benefit. It should be mentioned that at the time these several cases reported came under observation the disease was so far advanced as to leave no doubt of its malignancy.

I regret that want of time prevents more than passing notice of the utility of *x*-ray and radium treatment in uterine cancer. My use of either has not been sufficiently extensive to enable me to speak authoritatively as to their value. So far as my experience goes I regard the radium as far the more useful, in that granulating surfaces take on more healthful activity after its use than that which follows the use of the *x*-ray, and this is, I believe, in keeping with the recent observations. As illustrative of the results of palliative treatment I report briefly the following cases:

CASE 1.—The patient, a married woman, aged 43, entered the Skene Sanitarium, in March, 1901, with a cauliflower excrescence of the cervix as large as a man's fist. She had had numerous conceptions, all of which terminated in miscarriage; but as these were intentionally procured there was a well-grounded suspicion that her disease was related to the incident traumatism. This growth was reflected on the vaginal wall antero-posteriorly and laterally, which forbade a primary effort at hysterectomy. On March 14 I removed the growth by the galvanocautery and amputated the cervix at the vaginal junction. The surfaces healed kindly, save a small area on the uterine stump about the size of a silver half-dollar. On May 21, following, the patient re-entered the sanitarium and I performed an abdominal hysterectomy. Prior to this operation she was weak, anemic and in poor physical condition. Her convalescence was satisfactory. She was kept under monthly observation by her physician, and in May, 1902, a year later, there appeared at the seat of the vaginal cicatrix a nodular mass rather larger than a silver twenty-five-cent piece. At this time she entered the Memorial Hospital and I removed a button of structure, opening from the vagina into the peritoneal cavity, the size of a silver half dollar. I examined her during the past year and she is in perfect health, with no sign of the return of the growth.

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CASE 2.—The patient, a married woman, aged 46, German, multipara, dated her trouble to a miscarriage seventeen years previously. She had a large, bleeding, ulcerating cauliflower excrescence of the cervix, extending to the vaginal walls, which nearly filled the vagina. The discharge was offensive and the patient's health was seriously impaired from the frequent hemorrhages, associated with marked cachexia. She entered the Memorial Hospital Sept. 23, 1902, and on the 25th I removed the entire growth by the thermocautery. In two months' time it had healed under daily dressings, save for a cup-shaped cavity three-quarters of an inch in diameter and one-half inch deep. The patient's general health was greatly improved. Owing to non-healing she had two more thermocautery operations in November, 1902, and June, 1903. In November, 1903, the disease having made some progress without materially affecting the patient's general health, Roentgen ray apparatus was installed in the home and on every second or third day for nearly three months treatment was given. This was followed by the use of radium and the ulcerative process was greatly retarded, and the patients general health fairly maintained with but slight pain, up to the time of her death, May 7, 1904. For several weeks previous to her death the normal anatomic relations between the vagina, bladder and rectum were altogether lost and the amount of gauze daily used to fill this cavity amounted to many yards. During the twenty-one months of attendance the patient was visited by myself or my assistants about 750 times. It is at once apparent that such attention is most exacting in its demands on the attendant, but it demonstrated the fact that almost entire freedom from pain was the result, and that it was worth all it cost.

CASE 3.—The patient, a married woman, German, multipara, entered the Memorial Hospital in September, 1902, with carcinoma of the cervix. The typical symptoms of malignancy were in evidence. I did a high thermocautery operation, entering well up into the uterine cavity, which was unexpectedly followed by prompt healing. About four years ago the patient was in excellent health locally and generally; since that time I have lost track of her owing to the absence of her physician, Dr. Frederick A. Cook.

CASE 4.—During March, 1896, a married woman, multipara, aged 42, came under my observation with typical cancer of the cervix, accompanied with extensive involvement. Hemorrhage was violent and the patient was cachetic. She was greatly exsanguinated and very weak. She entered St. John's Hospital in March, and I did a high galvanocautery amputation as soon

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as her health permitted. She made a slow but satisfactory recovery, as far as the healing and local symptoms were concerned, and after two or three months she was able to resume her family duties. In November of the same year she entered the Bushwick Hospital for extirpation of a large gland of Bartholin. At this time there was no sign of return of the cancerous growth. On June 16, 1897, she re-entered the Bushwick Hospital, being seven months pregnant. The disease had returned, springing up around the old stump. After watching its behavior, I feared, from the hardening and infiltration of the uterine and contiguous structures, labor might induce rupture of the uterus, and on July 18, at the eighth month of pregnancy, I removed the diseased growth, which encircled the uterine outlet, by the thermocautery. No shock followed and the patient was delivered of a healthy living child on August 6. Her convalescence from the confinement was satisfactory, as was the healing after the cautery. She enjoyed good health for nearly a year. Then the growth reappeared and she entered the Central Hospital, June 21, 1898, and I removed as far as possible the cancerous mass which had returned. She returned home August 25. The healing was not satisfactory and she died a few weeks later from cerebral embolism, which only anticipated the inevitable results of her condition.

In the cases reported, ultimate recovery from the disease was not expected, and no promise of cure was held out to the patients. Patients 1 and 3, after periods from four to eight years, according to accepted standards, were cured. Patients 2 and 4 were greatly benefited and their lives were prolonged for years with very little suffering—a result unattainable so far as I know by any other method of treatment.

In view of these results, I appeal to the members of this Association, and to the medical profession everywhere, not to allow these cases of so-called inoperable cancer to go on without an honest effort to afford relief by the means herein recommended; these efforts will, I am convinced, be appreciated alike by the sufferer and her friends, will give the physician the sense of obligation and duty discharged, and perchance save some life to happiness and usefulness.

1050 Park Place.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BOLDT AND CHASE

DR. G. BETTON MASSEY, Philadelphia: I hope that within five years, as the undesirability of stimulating cancer tissue by traumatism is fully appreciated, we will see the end of cutting into the tissue itself, whether by the sharp curette or the knife. I protest against the curette in living cancer tissue as productive of regional and distant metastases. The tributes to the late Dr. Byrne in the papers on the thermocautery are pleasing and indicate progress in the right direction. While the thermocautery in cancer of the cervix represents improvement on previous procedures there are three practical objections to it: 1. The difficulty in avoiding accidental burning of the vagina. 2. The difficulty in maintaining a sufficiently high heat at the tip of the instrument. The loop must be heavy and the chances are that most of the heat is expended at the proximal end of the loop rather than at the tip, where the disease is most virulent, thus rendering the destruction of the actively-growing periphery uncertain. 3. The third objection is the horrible odor emanating from the slough during its separation, compared with the slight odor from sloughs produced by the electrosurgical use of zinc mercury ions. All these difficulties are avoided by the use of the electrochemical method, the technical details of which may be briefly stated as follows: With the patient in either the dorsal or Sims' position, and reclining on a large, moist kaolin pad, slender zinc needles of sufficient length and insulated to within 2 cm. of the tip are amalgamated and inserted in the diseased tissue and a current of 100 milliamperes turned on and maintained for thirty minutes. As the zinc-mercury points are connected with the positive pole the tips are dissolved and the two metals, in the form of ions, are driven into chemical combination, with the cancerous tissue, devitalizing and sterilizing it. The applications are repeated daily, being well-borne without anesthesia other than a possible dose of morphin, until a total current of 1,000 milliamperes has been employed for an hour, or the tissue seems free of the living growth, when they are intermitted for three or four weeks to permit the sloughs to separate. The best results are secured in the earliest cases, and in patients who are carefully watched for years afterwards and replaced under the method on the slightest evidence of abnormal conditions.

DR. J. H. CARSTENS, Detroit: The only difference virtually between my treatment and that of Dr. Chase is that I do not, as a rule, use the galvanocautery, but use chlorid of zinc, which I think accomplishes identically the same results. I teach the general practitioner, especially the practitioner from the country, to watch these cases, examine them every two or three weeks, and on the appearance of a little raw spot and the recurrence of the growth, it may be only the size of a

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pea, to remove it immediately and put in a wad of cotton with a saturated solution of zinc chlorid so that it will be cauterized, and this should be repeated when necessary. Of course, the cancer that is inside and is not ulcerated does not produce the serious results that we get from the ulcerated condition. The physician curettes thoroughly, cleans and cauterizes, or uses the *x*-ray, and the woman thinks for six months that she is well. Then there will be recurrence. Last year at the meeting of the Michigan State Medical Society I read a paper urging that a circular be issued by the state board of health on what women in the "cancer age" should know about cancer. A few of the things suggested were that a woman who was flowing more than usual was in a suspicious condition; that a woman who had a discharge at that time was in need of examination; that a woman who had a discharge which became irritating ought to be thoroughly examined. The circular should be small, just about ten lines. It must be short, otherwise, women will not read it. The State Board of Health has agreed to issue such a circular. It will be furnished to all the county societies so that all the physicians can distribute them. I furthermore suggested that cancer be taken up in the same way as has tuberculosis; and that every year, on a certain day in the year, there be what may be called "cancer day," when the people shall talk about cancer, and the symptoms of cancer, and every paper in the state shall publish an article on cancer. In this way I believe women would be led to consult their physicians before the condition was past hope.

Dr. C. C. Frederick, Buffalo: I have had some experiences which have been very satisfactory and which lead me to emphasize the points brought out by Dr. Boldt and Dr. Chase in the effort to stimulate general practitioners to make an effort at palliative treatment in inoperable cases of cancer of the uterus, and with the idea of lengthening the days and of securing some comfort for these poor unfortunates. I believe that no cancer of the cervix which has gone beyond the limits of the body of the uterus ought to be subjected to attempts at radical removal because it is futile. But the use of the curette and the cautery does do a great deal for these patients and some of them are cured. The patients will get rid of the infection which occurs; their appetites will improve, the anemia disappear, and for a time they will think they are well, and then they will go down again. To prevent them going down so rapidly the curette and cautery should be used every two or three months. In other words, the patient should be watched and the treatment repeated. I have two patients whom I consider cured. In one, a woman with inoperable cancer of the cervix, the disease occurred twelve years ago. I opened the abdomen with the idea of removing the uterus, but found that there was involvement at

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the vesicoperitoneal fold, and as she had been bleeding a good deal I tied both uterine arteries and closed the abdomen. I scraped out the cervix and used a cautery. She recovered, and to my astonishment that woman is living to-day. There is a hard cicatricial mass present, but she says that she is absolutely well. I cauterized her only once. What the cautery did and the tying off of the arteries in conjunction with the cautery I do not know. I suppose there was a diminution of the blood supply preventing the further growth of the carcinoma. I have another patient, treated similarly, minus tying the uterine arteries, four years ago last September. I cauterized and curetted the woman four times in the course of the year. The cervix contracted and later I did a total hysterectomy and she is perfectly well to-day. I have four other patients in whom I have done the same thing. The process of constriction due to the cautery, the scar tissue contracting and inhibiting the growth of the cancer cells render it possible often times at a later time to take out the uterus and make a clean operation with the chance of recovery.

Dr. Henry O. Marcy, Boston: I have one criticism to make of Dr. Boldt's instrument, it does not give the hand room. Many years ago I found in curetting that in leaving a piece of cotton about the area and applying the thermocautery, steam was generated in a considerable degree, and from that day on my colleagues and I have used a considerable amount of wet cotton packed above and below and we find that the steam thus generated penetrates the connective tissue deeper than the cautery itself and yet does not destroy the vitality of the structure. I believe that we can do a great deal in the palliative treatment of cancer.

Dr. John A. McGlinn, Philadelphia: I think the first part of Dr. Boldt's paper in reference to the necessity of early diagnosis is of special importance. If we fully realized just what this cancer problem means, probably we would be more alive to the necessity of waging an active campaign of education among the profession and laity for the early recognition of the disease. With our present knowledge our sole hope of combating the evil lies in its early recognition. That cancer is on the increase is beyond question. In the decade from 1890 to 1900 it showed, in the registration area, an increase of 12.1 per 100,000 population. Statistics show that it has increased in this area from 53 per 100,000 population in 1890 to 70.8 in 1906. Williams has shown that in England one woman out of eight past the age of 35 dies of cancer. In a recent paper I have shown that in the registration area one women out of eleven at all ages dies of cancer and past the age of 35 one woman out of nine will die of the disease. The age of greatest frequency is between 50 and 54, when one man in fourteen and one woman in five die of cancer. In the registration area in 1906, had cancer been cured, there would

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have been a total saving of life of 373,574 years, or a total saving of earning capacity of $224,144,400, enough to endow for all time laboratories and clinics of research which would eventually solve this most important problem of public health. In many parts of Pennsylvania the cancer death rate now exceeds that of tuberculosis. I have shown that if the present increase of cancer death rate and decrease of tuberculosis be maintained the foul plague will displace the white plague as the great curse of mankind by the years 1931. Practically one-third of all deaths due to surgical conditions are caused by cancer. When we reliaze that the uterus is the site in 27.68 per cent. of all cases of cancer in women, as gynecologists, we know that there is a splendid field for our endeavors. If such measures as Dr. Carstens suggested were adopted much could be done to eradicate this evil. As teachers we should remember that the profession needs to be educated in the need of early diagnosis just as much as the public.

Dr. I. S. Stone, Washington, D. C.: I am not going to discuss the question in its broadest sense. Twenty-five years ago Dr. Bryne taught us the application of the cautery in the treatment of cancer of the uterus and Dr. Van de Walker how to use the chlorid of zinc for the same disease, and I believe we have learned very little since that time. Dr. Smith, of the United States Fish Commission, has recently told me of something which may at some time in the near future be announced from one of the laboratories of the United States making a study of cancer. In a certain lake there have been observed innumerable fish with cancer of the thyroid gland. That at first thought seems a little thing, but there is an association of cause and effect right there which these men are undertaking to sift to the bottom by transplanting the disease into other fish. We have always had a hope that the proof would come of the parasitic nature of the disease. Of course, I know nothing about the project personally or experimentally, but I think that this little ray of hope is something which may give us encouragement and I want every one to believe that we will yet be able not only to teach concerning the danger of cancer, but that we shall eventually find a cure.

Dr. Howard A. Kelly, Baltimore: There are only two or three ways by which we can get around this cancer problem. One is by discovering the cause, and I hope we shall learn something from the work mentioned by Dr. Stone. Another method is by more radical operation. I feel that we have gone to the limit there. Another method is to get at the disease in an early stage. We ought to bend all our efforts to attacking the subject on that side. I would suggest circularizing the public and that we should not be too afraid of talking about these things in the public press. We talk a good deal about tuberculosis. This is a little more recondite, but when

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we have an enemy to face we have to bring him out in the open. We are entirely too reticent about telling reporters what they want to know, and in this way disseminating the information which will guide the people. One more suggestion is that every woman who has borne a child should be examined at least once a year from her thirtieth to fiftieth year. If this were done we would find the cases which to-day are coming to us too late to be helped. I use curettage and cauterization in these cases, but have a little different method from the one in general use. Dr. Spencer Brown, of Montclair, N. J., told me of the method of surrounding the parts with asbestos. When you get deep into the disease, instead of continually burning the area, use the asbestos around one of the electrodes; do not touch the disease, but hold the cautery while it cooks the tissues. Hold it at one place for three, four or five minutes, and then move it to another point. You will find this a very satisfactory and effective way of using the cautery.

Dr. John Osborn Polak, Brooklyn: In cases which seem beyond the reach of radical surgical procedure, the disease may sometimes be completely extirpated by the cautery. By the use of Byrne's divulsing tenaculum the uterus may be drawn into a large, yet short, Ferguson speculum, and the entire body of the uterus burned out with the cautery, leaving only the peritoneal shell. I know several women who are living from six to ten years after this treatment, who were beyond the reach of radical operation at the time they presented themselves. To make this procedure successful, sufficient time must be taken carefully to char every surface, and to permit the slow radiation of heat. Great credit should be given to the memory of Dr. Byrne for all he did for cancer, and those of us who have lived within the radius of his work can testify to the high character of it.

Dr. Emil Novak, Baltimore: The question of educating the public in the crusade against cancer is one of the greatest importance. I think that in the life-history of cancer we can recognize several stages: (1) From the beginning of the cancer until the woman first observes symptoms; (2) from this period until she brings her symptoms to the attention of the physician; (3) the period between the time she calls the attention of the general practitioner to her symptoms to the time they are brought to the attention of the gynecologist; (4) from the latter period until the operation is performed. These stages are all of variable length, as we all know. Very few men will hold that the surgeon himself is often culpable in delaying operation on cancer. I think that all of us realize that the general practitioner is frequently to be blamed for tardiness in bringing the cancer patient to operation, and that the patient herself is even more frequently to be blamed for allowing her symptoms to go on until she is in a hopeless condition. The only aspect of this general problem on which

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I wish to speak is the rôle played by the ignorance of the patient and the point already made by Dr. Carstens and Dr. Kelly on the value of circularizing the public. I have had some little experience in trying to educate the public along medical lines, not only concerning cancer, but on general hygiene. In Maryland, we have an almost perfect system of public instruction in medical matters, carried on by means of public lectures, along the same lines followed out at the Harvard Medical School, also by a system of minor lectures to organizations of various kinds, and finally, in a rather novel way—by means of the newspapers. The two largest newspapers in the state have joined hands with us, and we issue a wekly "health bulletin" in which topics of interest to the public are discussed by authorities on these subjects. The articles are not signed, but are simply labeled as being issued under the auspices of the state medical organization. Week by week both newspapers publish identically the same articles, and they have done a great deal of good. Among other things, we have discussed cancer, and although we realize that the newspapers offer the best medium for reaching the public, we have also come to realize that we cannot do as much with the newspapers against cancer of the uterus as against other diseases. Newspapers which do not hesitate to publish advertisements of "female regulators," etc., assume a very bizarre modesty in discussing such subjects as cancer of the uterus in their reading matter. I think Dr. Kelly is right in saying that from the standpoint of cancer of the uterus we must for the present rely mostly on pamphlets. In this way we will educate the public and the public will educate the newspapers. We want to create first of all a good healthful public sentiment. People die of cancer because they do not realize the significance of the early symptoms. Ignorance is the fundamental obstacle in attacking the question of cancer, and we must save the people, not from their own folly, but from their own ignorance.

Dr. H. G. Wetherill, Denver: I want to call the attention of the Section to a little device which is very useful for other purposes and which Dr. Kelly's suggestion leads me to think might be applied to this particular use. The instrument is what is known as a "blender" in a pyrography outfit; a platinum point, such as is used in making burnt-wood pictures, having an opening in the end. A stream of hot air passes through the hole in the point and without touching the surface with the point the tissues may be cooked or cauterized to any desired degree. I see no reason why it should not work within the speculum as Dr. Kelly has suggested. We now know that primarily cancer is a local disease and that the successful treatment of cancer hinges on its early diagnosis. When we devise some means by which an early diagnosis may be made, then the results of the treatment of can-

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cer may be improved. In the discussion on another paper the statement was made that there was no relation between fibroid tumors and carcinoma. We often find an association of fibroid tumors and carcinoma, but rarely find a true carcinoma originating in a uterine fibroid, and one sometimes sees uterine carcinoma which has not invaded an existing fibroid growth, but has skirted or circumscribed it. In some instances, however, fibroid tumors may cause carcinoma of the opposite wall of the uterus from pressure and irritation. We have that phase of fibroid tumors to think of in the consideration of this question.

Dr. H. J. Boldt, New York: The point has been this: All the talking that we do without some action is not going to be of benefit. I wish a committee might be appointed from this Section to formulate a set of resolutions in regard to the education of women concerning cancer. We will then get some results in the matter of early diagnosis. In the application of the galvanocautery a portable battery will not give a continuous heat sufficiently long, but if we have the direct or the alternating current, there is absolutely no trouble in getting enough heat. The prevention of burns has interested me very much. I have tried the different devices and find them all useless compared with the cooling speculum which I have shown. We may use any degree of heat and as long as desired without burning the vulva, or any part of the vagina on which we do not want the action of the heat. I have cauterized a large number of patients; furthermore, there is plenty of room to work through the speculum. The best form of treatment at the present time is enucleation with a sharp spoon. provided the disease has not advanced too far. Leopold has done considerable experimental work on animals, rats and mice; similar experimentation as is done in Buffalo. The important point is the early diagnosis. I hope some one will make a motion to the effect that the chairman appoint a committee from this Section to present resolutions to the main body, who shall communicate such resolutions to the public at large. The fact should be emphasized that cancer is not limited to any particular time of life. Women should be instructed to apply to their physicians at once on the first manifestation of any abnormal plevic symptoms. Then if the physician does not feel himself competent, or if there is any question as to the diagnosis, he should endeavor to have some one help him in the case.

Dr. W. B. Chase, Brooklyn: I am entirely in acord with the sentiments expressed by Dr. Boldt and the others regarding prevention. Dr. Polak was mistaken in the fact that reference was not made to Dr. Byrne's thermocautery methods of treating cancer of the cervix. I believe that the pain of cauterization is far greater than the majority of physicians believe it to be. In fact, as I know, the pain is so great that

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it is very serious; whereas, the after influence of thermo-cautery is practically painless. If the cutaneous surfaces are not burnt the subsequent pain is practicaly *nil*. I congratulate the Section that evidences of cure of certain cases of carcinomatous disease of the uterus, even when the treatment is undertaken as palliative, are coming to our notice. It certainly ought to be encouraging to every one of us not to forsake a case simply because we believe it to be hopeless. We have struck the keynote of the whole situation when we ask that knowledge regarding early successful treatment be disseminated, not only among the profession, but among the laity, the sooner will the mortality diminish. While we are doing all we can to disseminate information, it behooves us as physicians and surgeons that we do not forget suffering womanhood, and that we continue as best we may to meet the indications for relief of these sufferers.

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FINAL WORD ON THE STEM PESSARY FOR AMENORRHEA, DYSMENORRHEA, STERILITY, ETC.

J. H. CARSTENS, M.D.
DETROIT

The many inquiries I receive from all over the country about the use of the stem pessary, with requests for reprints of previous articles on the subject,[1] have prompted me to write another article on this question. It shows that the conditions mentioned in the title are difficult to treat. Knowing that the stem pessary will relieve the patients in nearly all cases, and in order to give this method of treatment thorough publicity, I again write on the above-named subject.

AMENORRHEA

This we generally divided into two classes, the one existing in young women in whom menstruation never made its appearance, and the other in patients in whom it has been established for a shorter or greater length of time and has suddenly or gradually disappeared.

Although there are great individual variations, large statistics in different countries show that the age of the first appearance of menstruation is about the same in the white race, viz., between the fourteenth and fifteenth year. The common people understand this perfectly, and if a young girl does not menstruate at about fifteen the mother begins to worry and perhaps treats

1. Carstens, J. H.: The Stem Pessary for Amenorrhea and Dysmenorrhea, THE JOURNAL A. M. A., Dec. 29, 1906, xlvii, 2133; Infantile Uterus, etc., Am. Jour. Obst., 1903, No. 5; The Stem Pessary for Dysmenorrhea, Ann. Gynec., December, 1904.

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her or consults a physician. We now well know that in some cases there is no need for treatment of any kind. The patient is backward in development, is perhaps anemic, chlorotic, suffers from indigestion, or has other conditions which generally retard the growth of the pelvic organs. With our rapid development and high education, in many young girls the vital energy is used up with study, and the menstrual function is slow in making its appearance. On the establishment of ordinary rules of hygiene and appropriate treatment such patients become stronger in the course of a year or two and the menstrual function makes its appearance without trouble.

But there are other cases in which no cause for the tardy appearance can be found, but the patients have symptoms of pain and distress recurring monthly. In such cases all the long list of emmenagogues which have been handed down to us for ages are of no avail. I have tried them faithfully and never saw any benefit from them whatever. I am by no means a therapeutic nihilist. Such patients need a thorough examination of the genital organs. There is no use wasting time with all kinds of treatment. These patients must be examined under an anesthetic. If there is an imperforate hymen, atresia of the vagina, or absence or defect of any of the organs of generation, proper surgical treatment must be instituted. These abnormal conditions do not concern us to-day.

Frequently we shall find that the uterus is small, a great deal smaller than it should be; sometimes it is bent. We have a so-called infantile uterus. Sometimes the whole uterus is small, only two inches in length. At other times it is of normal length, but is very thin. In some cases the body of the uterus seems poorly developed and in other cases it is the cervix. It may be the normal length, but only as thick as a lead-pencil.

This poorly developed condition is sometimes due to poor hygiene, improper method of living, too much

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mental work and too little physical exercise, resulting in a poor development of the whole body. In other cases the patient is physically well developed, but only the pelvic organs seem to be retarded. Now with this kind of cases I formerly had a great deal of trouble. I used applications, tampons, douches, and applied electricity until I got tired of it. I then began to use a small steel dilator like the Notts. By gradual dilatation two or three times a week I would develop some of these uteri to about normal size. It was painful, however, and would take months—yes, even years. Twenty-six years ago in an article I called attention to this method of treatment for amenorrhea and dysmenorrhea.

A good many years ago I read an article on the value of a string of beads introduced into the uterus for the purpose of bringing on a more profuse flow in scanty menstruation. The introduction of a foreign substance into the uterus struck me as a reasonable procedure. I then thought of the stem pessary as a possible means of relieving this condition and began to use it. I found so much benefit that I increased the indications for its use ever since.

PREMATURE ATROPHY

Then there is another class of cases in which menstruation has been regular and normal for years, but when the women are 30 or 35 years old it becomes scanty and skips and is painful. This condition you will find in women who are unmarried and take little physical exercises, but are hard workers mentally, teachers and others who hold positions of responsibility requiring a great deal of mental work. On account of non-use the uterus undergoes a premature atrophy, and on examination the uterus will be found small, like the infantile uterus above mentioned. In such cases wonderful improvement on the insertion of a stem pessary, allowing it to remain for a year or two. To this class may be added that class of superinvolu-

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tion of the uterus following confinement or miscarriage. Generally the same symptoms are produced as are found in the small uterus at puberty.

AMENORRHEA IN FLESHY STERILE WOMEN

Then there is a third class of cases. Women who live high, have good digestion and are hearty eaters become fleshy; the menstruation becomes scant and sometimes disappears entirely, and the women become sterile and develop all kind of nervous symptoms. I never saw any medicine give benefit in such cases, but by the insertion of a stem pessary and by control of the method of living wonderful benefits to the symptoms and reduction of fat can be brought about.

DYSMENORRHEA

This is one of the most intractable conditions to manage. In the past many normal ovaries have been removed as a last resort in such conditions. Some women suffer pain so that they are laid up every month for a day or two or even more. If they have positions they lose them, as nobody wants the young woman who is incapacited for work every little while. Many drug habits are started on account of painful menstruation. All the remedies, local or internal, that have been used and recommended give but little relief, except some kind of narcotic; hence we can readily see how necessary it is to find some means to permanently relieve this condition.

Authors have divided dysmenorrhea into different varieties, such as obstructive, inflammatory or congestive, membranous, and ovarian. We must, first of all, see that the pelvic organs are in normal condition, and if there is partial atresia it must be remedied by forcible dilatation, etc. But this recurs in the course of a couple of months and the operation has to be repeated. To prevent the recontraction I always insert the stem pessary after forcible dilatation. In cases of membranous dysmenorrhea I thoroughly curette the uterus and

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swab it out with pure phenol, insert the stem, and cure the patient. The so-called congestion and inflammatory conditions usually mean diseases of the tubes or pelvic peritonitis, and so on, and these require special surgical operations. The stem pessary is not only not indicated, but is liable to light up a dormant case and cause serious consequences.

The stem pessary is indicated in those obscure cases in which we can not lay our fingers on any particular abnormal condition—the kind that used to be called neuralgic; no general defect is found, no inflammatory condition, no displacement, or anything else, simply pain during menstruation. And let me add to this that other peculiar pain occurring just between the menstrual periods which the Germans call *Mittelschmerz,* the pathology of which we do not understand. It is marvelous what beneficial results are obtained in all such cases from the stem pessary.

DISPLACEMENTS

Originally the stem pessaries were devised to keep the uterus in about the normal position. Some stem pessaries were a combination of a retroversion or anteflexion and a stem pessary, all in one piece and difficult to introduce. Others were made of zinc and copper, supposed to have an electric action. But all kinds of stem pessaries were soon discarded because they caused trouble. In the course of my experience I found that in some cases in which there was a reflection or version besides the other conditions requiring the use of the stem pessary, the latter often helped the displacement if worn long enough. As the general health of the patient improves, the ligaments regain their original tone. But the pessary must be worn at least a year or more.

STERILITY

Many of the conditions requiring the use of the stem pessary are also the cause of sterility. I had that impressed on me by some of my earlier cases. A woman,

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married five or more years, who had suffered from some of the above-mentioned conditions, became pregnant after removal of the stem, which she had worn for three months. This gave me another indication for the use of the stem; and, in fact, some of my patients were kind enough to call the attention of sterile patients to the fact that they had been relieved by the stem pessary and sent them to me, so that in the course of time I have had several patients who afterward became pregnant, although I never promise to relieve that condition. There is nothing lost in trying the pessary, even if it fails. Sterility is sometimes caused by poorly developed mucous membrane of the uterus and the presence of a foreign substance in the uterus, I think, will strengthen and develop the lining membrane.

COUNTER-INDICATIONS

Velpeau, in 1840, was the first, I think, to urge the use of the stem pessary. Others took it up, especially Simpson. Different kinds and shapes were devised. But in those days the pessary was used for displacements principally, and, as many of the displacements were the result or coincidence with pelvic troubles, pus tubes, etc., it can now be readily seen how serious results followed their use. Dormant pelvic inflammations were relit; in fact, septic micro-organisms were sometimes introduced in the uterus and persons otherwise and previously healthy soon developed pelvic trouble, so that in the course of time the profession tabooed the use of the stem pessary. It is well known that, though repeated efforts were made to re-establish their use, they soon fell into disuse again, and very justly, as they were not properly used and counter-indications not well established. Dysmenorrhea was frequently caused by pelvic inflammations of various kinds and a careless physician might use a stem pessary in such a case with disastrous results. These cases require surgical interference of entirely another kind. Versions and flexions with ad-

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hesions require different treatment. A movable displacement requires an Alexander operation or something of that kind. The stem pessary is indicated only when there is no septic or inflammatory condition in the pelvis. Such conditions must be rigidly excluded; hence it is readily seen that the principal indication for the use of the stem is in young or unmarried women. I have had a few cases in which the stem would not be tolerated and had to be removed. In some the pessaries came half out, as the result of falls from a swing or a bicycle, and had to be removed and reinserted. Hence I want to warn the profession not to use the stem indiscriminately and again bring it into bad repute. Judiciously used, it will be a valuable aid in the treatment of these otherwise intractable cases.

TECHNIC

The introduction of the stem requires dilatation of the uterus. As this is very painful, it is necessary to give an anesthetic, although it may take only five minutes. Then the absolutely cleaning of the vagina is necessary.

I use the Chambers hard rubber stem, although others may be as good. That everything be aseptic I boil the stem with the instruments, but, as the two arms of the stem come together while boiling, I immediately, when taking them out of the hot water, separate them and dip them in cold water so that they will stay open. Generally I have the patient on the back; with vulsellum forceps I catch a lip of the uterus, pulling it down somewhat and straighten it out as much as possible. I now insert a sound to get the exact length of the uterine cavity. Then I select a pessary a little shorter (¼ or ⅓ inch) and have it ready for insertion by fixing it into the introducer. Now I dilate the uterus. As this is often small it is necessary to start with a fine-pointed dilator. I use the Notts dilator. This generally is not sufficient and I then use the Goodell-Erlanger dilator

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or any other kind, thoroughly opening the uterus. If there should be any endometritis or discharge from the cervix I thoroughly curette the cervix only and swab it out with pure phenol, wiping it dry. I can then insert the stem. The button at the end must be on the cervix. The stem is kept in place by a finger on the button; then the introducer is pulled out and the thing is done. If indicated, a Thomas-Hodge pessary is inserted. The physician must see that the button is in the center of the retroversion pessary. There may be a little blood lost from the dilatation; therefore, I give phenolized douches twice a day for a day or two while the patient remains in bed. Some can get up the next day, but, as a rule, I keep them in bed for forty-eight hours. Then they can get up and go about their usual vocations. They can do anything and everything, as they always did, and never know that they are wearing stem pessaries. Once in a great while in women who are very constipated the pessaries may be forced out by straining. This sometimes also occurs in cases of relaxed vaginas. In the latter the soft rubber inflated pessary will often help to retain the stem in place.

All I ask of the members of this Section is to give the stem a fair trial in those properly selected cases in which ordinary treatment has failed and let us hear the results.

620 Woodward Avenue.

ABSTRACT OF DISCUSSION

Dr. Howard A. Kelly, Baltimore: I think it would be interesting if the members would give their experience. I supposed that the old-fashioned method of using a pessary had been discarded a generation ago. I practically never use internal appliances for any cause whatever, that is, extending over any period of time. I have never used a stem pessary. I don't see just what good it can do. I have seen a great deal of harm result from the use of pessaries, and therefore, I have not used them.

Dr. H. P. Jack, Canisteo, N. Y.: Often the uterus will either raise children or raise something else. We often see in women engaged in mental work the most severe suffering from

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dysmenorrhea and scanty menstruation. I have in mind a woman who, in spite of the most careful treatment, had become a nervous wreck and who had not menstruated for eight months. Following the method of Dr. Carstens, I used a stem pessary and since that time she has menstruated, not profusely, but regularly. She has developed from a nervous wreck to a healthy, robust, well-feeling young woman. I could report several other cases in which the results have been equally striking, in which women have been transformed, so to speak, from invalids to healthy capable persons.

Dr. A. E. Benjamin, Minneapolis: I have been using the Outerbridge speculum instead of the stem pessary, although I have used Dr. Carstens' stem pessary in several cases and must report good results in some of them. We must be sure that a case of amenorrhea is due to a lack of development of the uterus or of the ovaries. Dr. Carstens has thrown out a few suggestions in regard to the use of the pessary, but we must be absolutely sure that there is not an undeveloped condition of the adnexa, particularly of the ovary. I have seen a number of cases in which a fibrocystic degeneration was taking place; and it must be remembered that amenorrhea will occur on that account. In some of these cases laparotomy was done, the ovaries were resected, cysts removed and menstruation and pregnancy have followed. In cases of dysmenorrhea I have used the Outerbridge speculum introduced just previous to the menstrual flow. Its spring-like action keeps the cervix open. It is one of the best instruments we can use at that time. Also in dysmenorrhea we must be sure that the difficulty is not due to some condition outside of the uterus, that is, in the pelvis. For sterility the same instrument can be used. A few cases I can report in which pregnancy occurred by the use of the Outerbridge speculum, but in most cases I think that Dr. Carstens' stem pessary can be used with greater satisfaction. I believe with Dr. Kelly that nothing should be introduced into the uterus to be left there for any length of time. But when one can restore the function of the uterus and produce a more normal mental state by the use of some of these things, I think their employment is justified.

Dr. J. H. Carstens, Detroit: How can any one judge of a thing he has never used. Thirty or forty years ago it was a serious matter to use these pessaries; they were inserted and severe inflammation was the result. To-day we see great benefit resulting from their use. I have women traveling all over the world wearing these stem pessaries, and able to do all kinds of work.

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CONDITIONS SIMULATING TUBAL PREGNANCY

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ST. LOUIS

This subject is of interest to every one called to make a diagnosis in acute abdominal affections. My remarks shall be confined to conditions simulating early tubal pregnancy. The cardinal symptoms of early tubal pregnancy are (1) a missed menstruation, (2) sudden onset of pain (with or without shock), (3) bloody vaginal discharge, (4) a tender mass beside the uterus, (5) only slight fever, and (6) exacerbations of the pain and enlargement of the mass without corresponding elevation of temperature. In atypical cases, there may be decided fever or onset of pains without missed menstruation or other variations from the rule. Again, the internal hemorrhage may be very severe at first, requiring a diagnosis at once before the appearance of later confirmatory evidences. It may be impossible to feel a mass, for the liquid blood itself gives no well-marked resistance and yet causes so much tenderness that the enlarged tube can not be satisfactorily palpated. Freshly coagulated blood gives a bogginess, but not a distinctly outlined mass. After a short time there develops a distinct mass, due to the fibrin and adhesions and infiltration associated with the blood-clot.

The difficulties of differentiation are due largely to the fact that many cases of extrauterine pregnancy are atypical in symptomatology—presenting some of the prominent symptoms, but lacking others. Now there are other affections that may present two or three of the promi-

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nent symptoms of tubal gestation, and if the distinguishing characteristics of the other affection happen to be absent or obscured a mistake in diagnosis is probable. Time will not permit consideration of all the conditions that may simulate tubal pregnancy; only a few of the more common ones may be discussed. These may be grouped into two classes—first, those conditions in which the principal feature is a tender pelvic mass, associated with some of the other symptoms of tubal pregnancy, and, second, those conditions in which the principal feature is sudden abdominal pain and collapse without apparent cause, i. e., without the disturbances that usually precede or accompany collapse from other diseases.

A TENDER PELVIC MASS WITH OTHER SYMPTOMS OF TUBAL PREGNANCY

GONORRHEAL SALPINGITIS

With no other disease have I experienced so much difficulty in differentiation from early tubal pregnancy as with salpingitis of gonorrheal origin. Typical cases of salpingitis are, of course, easily distinguished from typical cases of tubal pregnancy. The difficulty lies in the fact that either may be atypical, and as they become atypical they may approach each other until their manifestations are practically alike—that is, gonorrheal salpingitis (atypical) may produce the symptoms and signs of tubal pregnancy (slightly atypical). Such cases are not very frequent, but they are encountered occasionally in the examination of a large number of cases of supposed extrauterine pregnancy, and when encountered they prove most deceptive and misleading. In each of the following cases (some of which were mentioned in a previous article[1]) the deceptive combination of symptoms was sufficiently complete to cause a mistake in diagnosis.

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1. Crossen, H. S.: Ectopic Gestation Symptoms in Gonorrheal Salpingitis Cases, read before the Missouri State Medical Association, May 20, 1909.

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CASE 1.—*Old Gonorrheal Infection.*—Patient, aged 32, referred to me by Dr. J. D. Beatty, of Troy, Mo. Last normal menstruation August 10. In September went over time ten days. Felt as well as usual and suppposed herself pregnant. No stomach disturbance or breast pains. About September 20 had a scanty flow for two days. She felt well and there was no further bloody discharge for two weeks, when it started again. A day later she was seized with severe pains extending all through the lower abdomen. No shock, just pain, at times cramp-like. This pain continued off and on for a week. Patient was confined to bed and had to be given morphin. A physician was called and made a diagnosis of abortion. No membranes passed and there was only one small clot. Patient was then curetted but not much was obtained—apparently only some thickened endometrium. No fetus or membranes or shreds of tissue were seen at any time. Patient felt better after the curettement, but still continued sick, confined to bed with abdominal pain and tenderness. Temperature 99 to 100. Twelve days later, as there was no material improvement, the uterus was curetted again, but without result. The trouble continuing, Dr. Beatty was called in consultation. The abdominal pains and tenderness continued and the temperature then (after the second curettement) ranged from 100 to 101. Six days after the second curettement the patient was brought to St. Louis and placed under my care.

Examination.—This showed the uterus retrodisplaced and fixed, and blended with a tender mass of adnexal origin extending into both sides of the pelvis. The average temperature was 100; pulse, 98; respiration, 20. The lowest temperature was 99.2 and the highest 100.6.

Diagnosis.—There was evidently serious adnexal trouble of apparently recent origin, and any of the following diagnosis was possible: (1) salpingitis following miscarriage, (2) an acute exacerbation of a chronic salpingitis, and (3) tubal pregnancy with repeated slight hemorrhages. Against the first were the low temperature (much lower than consistent with an acute infection of sufficient severity to cause the symptoms) and the absence of evidences of miscarriage. Against the second, were the low temperature with acute symptoms, no history of preceding severe symptoms indicating old suppuration in the pelvis (though there had been mild pelvic distress for some years) and the association of the trouble with missed menstruation, followed by sudden onset of pain and the appearance of an irregular bloody vaginal discharge. If due to an old inflammatory trouble one would expect the menstrual flow to be increased instead of missed, and the pain and other symptoms to

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be of rather gradual onset and increasing in severity as fluctuation appeared in the mass. In favor of the third (tubal pregnancy) were missed menstruation followed by sudden onset of pain, irregular bloody discharge, absence of positive evidence of a miscarriage, and the presence of fluctuation in the mass, associated with low temperature (much lower than was consistent with a pocket of pus). It seemed a fairly clear case of tubal pregnancy—one of the class frequently met, in which there is no great loss of blood at one time, but repeated slight hemorrhages with a gradually increasing mass. Accordingly that diagnosis was made.

Operation.—On opening the abdomen no tubal pregnancy was found. The trouble was chronic adnexal inflammation—there being a tubo-ovarian abscess on the left side, which gave the fluctuation, and chronic salpingitis on the right side, the remaining part of the mass being formed by adhesions and exudate. The damaged adnexa and the chronically inflamed appendix were removed and the uterus fastened forward.

The patient made a prompt recovery with complete relief.

Careful bacteriologic investigation of the removed adnexa showed no bacteria of any kind. This excluded recent infection. The case was evidently one in which there was a gonorrheal infection long ago (there were confirmatory facts in the history), the development of pyosalpinx with only slight symptoms of a mild character, the death of the bacteria (which commonly takes places in gonorrheal pyosalpinx), and the persistence of sterile pus in a sac which acted as an irritating foreign body in the pelvis. No evidence of pregnancy was found. Why the menstruation was missed I can not say. In some other cases of gonorrheal salpingitis I have encountered this misleading symptom.

CASE 2.—*Right Pyosalpinx.*—Mrs. D., aged 21, admitted to the Gynecologic Department of Washington University Hospital. In November missed menstruation. Had nausea and vomiting in the mornings and in December noticed sensation of fulness in the breasts. There appeared an irregular bloody discharge twice in December, the last time on the 26th, from which date it continued until the patient entered the hospital on January 9. She came for treatment on account of rather severe pain which had appeared the last few days in the right ovarian region. This was so severe that she had had to stay in bed on the previous day. The patient had been married five years, and her history indicated that immediately following marriage there was an attack of gonorrhea, resulting in pelvic inflammation. This troubled her more or less for a year,

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when she recovered completely and for four years had had no pelvic trouble of any kind except some leucorrhea.

Examination.—On admission her temperature was 100.6; pulse, 90; respiration, 24. Examination revealed a tender mass to the right of the uterus, evidently adnexal. The temperature later that day was 101, and the next day was 99 in the morning and 101 in the evening. After that the temperature remained low, ranging from 98 to 99, only once reaching 100.

The patient was kept under observation and palliative treatment for twelve days. There were irregular attacks of pain in the pelvis and the mass gradually enlarged. The missed menstruation, followed by irregular bloody discharge, onset of severe pains, development of a mass in the tubal region, and peristent enlargement of the mass with continued low temperature, seemed to justify a diagnosis of tubal pregnancy—which diagnosis was made.

Operation.—When I opened the abdomen no pregnancy was found, but instead a right pyosalpinx (chronic), which undoubtedly dated from the previous gonorrheal inflammation, though it had given practically no symptoms during the period of four years. The pus sac was removed and the patient recovered.

CASE 3.—*Acute Double Salpingitis.*—Patient, aged 19, referred to me by Dr. George F. Chopin, of St. Louis. About two weeks after marriage she failed to come unwell properly. At the menstrual time there was a slight bloody discharge, but not a good menstrual flow. There was some soreness and pain in the pelvis. After this had continued a few days she was seized with sudden severe pain in the lower abdomen, accompanied by shock. With the weakness and faintness and pain she could hardly move, even to turn over in bed, for several hours. The severe pain gradually subsided but marked soreness remained, so much so that the patient was obliged to lie very quiet. A physician who was called examined the patient and said that she was having a miscarriage. A partial curettement was carried out, but only a small amount of blood was removed. No fetus, membranes or large clot was passed at any time. The patient and her husband then became uneasy at the apparent seriousness of the trouble and the day after the curettement called Dr. Chopin, who asked me to see the patient.

Examination.—The patient was confined to bed with pain in the lower abdomen and a bloody vaginal discharge. There was marked tenderness on abdominal and bimanual examination, and there was a boggy induration on each side of the

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uterus with marked tenderness. No membranes or shreds were found in the cervix or in the bloody discharge. The discharge was blood and mucous, without noticeable pus admixture. The trouble seemed to be around the uterus rather than in it. The temperature was low, fluctuating between 100 and 101. Here was a patient, apparently previously healthy, seized with a severe abdominal pain and decided shock, associated with imperfect menstruation, an irregular bloody discharge, a tender mass partially surrounding the uterus, and low temperature. I made a tentative diagnosis of tubal pregnancy with some internal hemorrhage, but not being entirely satisfied, I concluded to watch the case for a while.

Under mild sedatives and strict confinement to bed the patient became very comfortable. The temperature ran about 100. After a few days she felt so much better that, without my permission, she began to go to the washstand. On one of these trips across the room she was seized with pain and almost fainted before she could reach the bed. There was then more pain and pelvic soreness and an increase in the tender mass about the uterus. I then insisted on the patient's removal to the hospital, where she was kept under observation for five days longer. On admission the temperature was 101.2; pulse, 100; respiration, 24. There was considerable abdominal pain, requiring a sedative occasionally. The next day the temperature was 99 and for four days did not go above 99.6. In the meantime the patient felt comfortable, could sleep well, her appetite returned, and the pelvic soreness diminished. The bloody discharge continued. The fifth day, without apparent cause, the abdominal pain returned and became very severe. The pulse rose to 132; temperature, 100.6; respiration, 24. On examination the tender pelvic mass was found to be larger. The tentative diagnosis of tubal pregnancy seemed confirmed by the spontaneous recurrence of severe pain, the rapid pulse, and the continued enlargement of the pelvic mass with low temperature.

Operation.—When I opened the abdomen I found there was no extrauterine pregnancy, but instead an acute double salpingitis, with leakage of pus into the peritoneal cavity and the formation of extensive adhesions. The tubes were so badly damaged that I thought best to excise them. After establishing free drainage of the infected area, I explored the interior of the uterus, thinking that possibly there had been a miscarriage after all, with infection following it; but no evidence of pregnancy was found.

The patient recovered without particular incident.

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Examination of the pus from the tubes showed gonococci in abundance and in pure cultures. The case was one of gonorrheal infection following marriage, the infection affecting the vagina but slightly and passing rapidly up into the uterus and tubes and out into the peritoneal cavity. A striking fact, and perhaps the most misleading one in this particular case, was the absence of the usual evidences of acute gonorrheal vaginitis (burning on urination, vaginal tenderness, and free purulent discharge). These were so slightly marked that there was no suggestion of the trouble being acute gonorrhea. The purulent character of the discharge was obscured by the blood in it. Had I examined the discharge microscopically, gonorrhea would at once have been evident.

CASE 4.—*Pelvic Abscess Probably Originating from a Gonorrheal Pyosalpinx.*—Mrs. B., aged 27, admitted to the Gynecologic Department of Washington University Hospital. The previous history is somewhat uncertain, but the more prominent facts were that she had been sick for two or three weeks with some abdominal trouble characterized by a sudden onset of severe pain, a continuous bloody vaginal discharge, an increasing mass in the lower abdomen, and not much fever.

When admitted the patient was very sick, with a large tender mass in the right side of the pelvis and lower abdomen, and much peritoneal irritation. Temperature, 97.6; pulse, 116; respiration, 24. During the afternoon the temperature went to 102 and the pulse to 124. The next day the temperature varied from 99.2 to 100.4. After that it ranged from 98.6 to 100, only twice getting as high as 100.6 and never above that. The patient was kept under observation for seven days. The process continued active and progressive. The abdominal pain was very troublesome and required sedatives. The mass gradually enlarged until it extended almost as high as the umbilicus. The low temperature seemed to exclude inflammatory trouble of sufficient severity to cause such a mass, and particularly such rapid enlargement of the mass. The case was closely observed and carefully studied. No hypothesis explained the condition present so well as ruptured tubal pregnancy, with repeated hemorrhage and resulting irritation and exudate. Accordingly that diagnosis was made.

Operation.—This revealed a large abscess occupying the pelvis and extending almost to the umbilicus. There were no blood clots or other evidences of tubal pregnancy. Everything was so matted together that no attempt was made to separate the various structures. The pus was evacuated and the cavity drained.

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The patient made an excellent recovery. The exact cause of the abscess was not certain, but it was supposed to be of tubal origin and probably arose from a gonorrheal pyosalpinx.

It may be thought that the temperature of 102 for a day was enough to exclude tubal pregnancy as the causative factor, but such is not true, for in many cases of extrauterine pregnancy with hemorrhage the temperature will run up temporarily to 102 and higher. The following is a case in point:

CASE 5.—*Unabsorbed Blood in Peritoneal Cavity.*—Mrs. P., aged 31, admitted to the Gynecologic Department of Washington University Hospital. On admission her temperature was 101.4 and pulse 140. She gave a clear and typical history, and the diagnosis of ruptured tubal pregnancy was postive. The hemorrhage had been so severe, however, that she was in very poor condition for operation. The hemoglobin had been reduced to 30 per cent., which made operation or even anesthesia alone very dangerous. As the hemorrhage had stopped and she was improving, it was decided to defer operation until it could be carried out with less danger. The waiting period was seven days. During that time the temperature went up to 102 nearly every day and one day reached 103.4. After seven days the blood condition had improved (hemoglobin above 40 per cent.) and she was so much improved otherwise that operation was carried out. There was no pus in the peritoneal cavity—simply the unabsorbed blood. The patient recovered promptly.

CASE 6.—*Right Pyosalpinx, Probably of Gonorrheal Origin.*—Reported by Butler.[2] Patient, aged 26, married six months, had been perfectly healthy with normal menstruation history. Two months after marriage she missed a menstruation. The previous menstruations had been regular and without pain. There had been no yellow discharge, no leucorrhea, no urethritis, nothing abnormal, and, aside from the amenorrhea, patient felt well. Nine days later the menstrual flow appeared. Three weeks after that there was a bloody discharge, not like the usual menstrual flow, but irregular, stringy, with clots, and shorter in duration. Three weeks later she had severe pain in the side and thought she was going to menstruate but did not. That month the menstruation was missed entirely, there being not even a show of blood. Four weeks after the attack of pain she had what appeared to be a normal menstrual flow. About a week later she was seized

2. Butler: Brooklyn Med. Jour., 1903, xvii, 140.

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with severe pain in the abdomen, had some nausea, and vomited once or twice. This passed off in a short time. One week after that she had another attack of pain and was confined to bed.

Examination.—When seen by the physician, the patient complained of considerable faintness, her pulse was 110, and there was a slight rise of temperature. Examination showed a large irregular mass, tender to touch and situated posterior to the uterus. The uterus was pushed forward and upward. From the history and the examination findings, a diagnosis of tubal pregnancy was made.

Operation.—No tubal pregnancy was found. There was a large pus tube in the right side, with surrounding adhesions. The low temperature and slight reaction incident to the pus formation, indicate that the pyosalpinx was of gonorrheal origin.

Other similar cases have been reported, but I shall not take the time to detail more.

MISCARRIAGE WITH OTHER ABNORMALITY

CASE 7.—*Miscarriage and Ovarian Tumor.*—Reported by Brown.[3] A patient who had missed the menstruation for three weeks and had all the symptoms of pregnancy, was attacked with pains through the lower abdomen. A physician was called and found the patient confined to bed, with abdominal pain, partial suppression of urine, temperature of 102.5, and evidently severe inflammation from some cause.

Examination.—The uterus was found pushed back by a large mass in the right side of the pelvis. The physician watched the case for four or five days, and felt confident that the trouble was tubal pregnancy, with rupture, hemorrhage, and resulting inflammation. Dr. Brown, who was asked to see the case, made the same diagnosis.

Operation.—This revealed an ovarian cyst and general peritonitis. Exploration of the interior of the uterus showed that there had been a recent abortion. The miscarriage was evidently the cause of the peritonitis, which eventually proved fatal.

CASE 8.—*Miscarriage and Ovarian Tumor.*—Reported by Fortun.[4] A patient who had missed the menses, had pains in

3. Brown: Am. Gynec. and Obst. Jour., 1897, x.
4. Fortun, E.: Three Mistaken Diagnoses of Extrauterine Pregnancy, Rev. de med. y cirug. de la Havana; abstr. in THE JOURNAL A. M. A., 1905, xlv, 364.

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the lower abdomen, followed by bloody discharge. The evidences of abortion were not sufficiently distinctive to justify a positive diagnosis of the same. In the presence of this suspicious history, examination revealed a tender mass in the pelvis beside the uterus, and a diagnosis of extrauterine pregnancy was made. Operation revealed that the trouble was an ovarian tumor associated with an early miscarriage.

CASE 9.—*Miscarriage and Broad-Ligament Tumor.*—Reported by Fortun.[4] This case presented practically the same features as the preceding one, namely, missed menses, abdominal pain, bloody discharge and a tender mass beside the uterus. Diagnosis, extrauterine pregnancy. Operation demonstrated that the symptoms were due to a tumor (sarcoma) of the broad ligament, associated with an abortion.

PREGNANCY WITH ABNORMALITIES

There are various anomalous conditions that may cause an intrauterine pregnancy to simulate an extrauterine pregnancy.

CASE 10.—*Pregnancy with Hydatidiform Mole.*—Mrs. S., aged 21, came into my service at the St. Louis Mullanphy Hospital, with a diagnosis of extrauterine pregnancy. There had been no menstruation for two months, and there were the usual symptoms of early pregnancy. Recently the patient had been having attacks of pain in the lower abdomen, accompanied by a bloody discharge. These attacks of pain had been irregular—at times severe and confining her to bed, while at other times she was able to be about the house. Finally they became so disabling that she was brought to the hospital.

Examination.—When I saw her she was confined to bed, with a mass the size of an orange pushing forward the anterior abdominal wall just above the pubes. The mass was firm, painful on pressure, partially fixed, and it was here that the patient located the pain and distress. There was a bloody vaginal discharge. Temperature, pulse and respiration were practically normal. On bimanual examination the deeper portion of the mass could be made out, and it was found to be the size of a child's head. Indistinct fluctuation was obtained. The body of the uterus could not be made out, but the impression obtained was that the mass lay in front of the corpus uteri, which was pushed backward and could not be felt on account of the mass. The forward projection of the mass against the abdominal wall was very marked.

I was inclined to agree with the diagnosis of extrauterine pregnancy, but was not entirely satisfied, as I had not located

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certainly the body of the uterus. I concluded to watch the case for a while. The patient was kept absolutely quiet and sedatives were given as needed for the pain. The patient was better for a time but later the pain recurred. It troubled her every day, at times quite severely, but could not be identified as uterine contraction pains. No variation in the consistency of the mass was noticed. The bloody discharge continued. A few very small clots were noticed, but no membranes or shreds. I continued the observation for ten days, and the longer I observed the more confusing the conditions became. The process, whatever it was, was progressing rather rapidly. In the ten days the mass had enlarged decidedly and the pain had increased—so much so that at the end of the period it was evident that something must be done, as further prolongation of the trouble would seriously weaken the patient, who was not very strong at the beginning. The crucial point, which so far I had been unable to decide, was whether the mass was uterine or extrauterine.

Operation.—I decided to examine the patient under anesthesia, having everything ready to operate in case the mass proved to be extrauterine. Under the complete relaxation of anesthesia I was able to determine that the cervix expanded symmetrically into the mass, which was thus identified as the body of the uterus. It was found, however, to be twice as large as it should be at that period of pregnancy. This abnormal enlargement with the prolonged bloody discharge and the increasing pain made it evident that there was some serious pathologic condition within the uterus and not a normal pregnancy. I dilated the cervix slightly, and there escaped several small cysts. That made the diagnosis plain, and I then dilated the cervix widely and removed from the uterus a beautiful specimen of hydatidiform mole. The uterine cavity was literally packed with the grape-like bunches of minute cysts characteristic of this condition. No trace of a fetus was found. The patient recovered without further trouble, and has since given birth to two children, the pregnancy, labor and puerperium in each case being normal.

CASE 11.—*Pregnancy with Hysteria and Uterine Displacement.*—While I was in charge of our city hospital for women (St. Louis Female Hospital), a patient was brought into that institution on a stretcher, suffering severe abdominal pain and apparently very sick. The suffering was so great that the history was obtained with difficulty. She had missed the menses about four months, and the usual symptoms of pregnancy had been succeeded by irregular attacks of pain which culminated

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in the severe attack which caused her to be hurried to the hospital.

Examination.—The abdomen was sensitive and the muscles rigid. In the right lower abdomen there was a distinct mass, very painful to touch. On bimanual examination it was found that this mass extended down into the right side of the pelvis, which it largely filled. It was about the size of a child's head, extremely tender, apparently fixed and presenting indistinct fluctuation. The cervix was somewhat softened. The body of the uterus could not be made out on account of the marked tenderness and the resulting muscular rigidity, which interfered with deep palpation. The pulse was rapid but of fair volume. There was no fever. I was quite certain that the trouble was extrauterine pregnancy. Examination under anesthesia, however, showed that it was an intrauterine pregnancy. The fixed and tender mass in the right side was the pregnant uterus, which was freely movable under anesthesia.

After the examination, the symptoms largely disappeared and the patient was able to leave the hospital in a short time. The misleading features were the severe abdominal pain and tenderness, associated with a lateral pelvic mass which was extremely tender (hysterical hyperesthesia) and fixed (by the rigid contraction of the abdominal muscles) and which could not be identified as the body of the uterus (because of the marked softening just above the cervix, and also because of the impossibility of deep palpation). Anesthesia removed the difficulties at once and permitted a correct diagnosis.

This case and the preceding one serve to emphasize the necessity of careful examination under anesthesia before operation in all such doubtful or uncertain cases. It must be kept in mind, however, that when tubal pregnancy is suspected the patient should be placed in a hospital and prepared for operation before the examination under anesthesia is made, for if the trouble is tubal pregnancy the manipulations of the examination may cause rupture and hemorrhage, requiring immediate operation.

CASE 12.—*Pregnancy with Irregular Softening of Uterus.*—A patient with supposed extrauterine pregnancy was brought to St. Louis by her physician and placed under my care. About five months previously she had missed her menses and presented the usual symptoms of pregnancy. Three months later she had abdominal pains accompanied by a bloody discharge from the uterus. The bleeding stopped but the pain recurred

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at irregular intervals and there was an enlarging mass, which could not be identified as part of the uterus. Her physician called several others in consultation and the consensus of opinion was that the pregnancy was extrauterine; hence she was brought to St. Louis for operation.

Examination.—I found a very puzzling condition. The body of the uterus was irregular in shape and irregularly softened, and gave at first the impression of a fairly firm mass not connected with the cervix, the portion immediately above the cervix being so softened as to be hardly palpable. After examining for some time, it was finally determined that the mass was the enlarged and pregnant corpus uteri. The rhythmical hardening of the uterine wall aided materially in the differentiation. By prolonging the examination, I was able to feel the previously softened portion harden under the finger, and could then make out that the upper part of the cervix expanded symmetrically into the mass in question. After working out the diagnosis, I was able to demonstrate it satisfactorily to the patient's physician, who examined her with me.

CASE 13.—*Pregnancy with Retroflexed Uterus.*—Reported by Royster.[5] Patient, aged 22, married sixteen months, missed her menses three times in succession, had nausea and vomiting, and also tenderness of the breasts. Then she had an attack resembling cholera morbus and a slight bloody stain from the genitals, but no distinct hemorrhage. The signs of pregnancy then became less marked. She complained of pain in the lower abdomen, especially in the left side, and of frequent and painful urination.

Examination.—There was found a mass chiefly in the left side of the pelvis and pressing down the posterior vaginal fornix. It was boggy and tender to the touch. The uterus appeared to be pushed to the right side and was intimately associated with the mass. A sound was readily introduced into the uterus to the depth of three inches, indicating that the uterus was about normal in depth and was empty. A diagnosis of extrauterine pregnancy was made and the patient operated on accordingly.

Operation.—This revealed a retroverted pregnant uterus, twisted somewhat toward the left, and with the wall softened irregularly. There was no extrauterine pregnancy. The uterus was brought into correct position and a small cyst of the ovary removed. The patient recovered without incident and the pregnancy continued.

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5. Royster: Charlotte Med. Jour., 1903, xxii, 1.

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CASE 14.—*Pregnancy with Retroflexed Uterus.*—Reported by Davis.[6] Patient, aged 20, emaciated and anemic, had previously aborted between three and four months, with very free bleeding. After several months she again developed symptoms of pregnancy, followed by attacks of pain in the abdomen, with hemorrhage from the vagina and a rapid, feeble pulse.

Examination.—The pelvis was found filled with a soft boggy tumor, completely occupying the posterior cul-de-sac. The body of the uterus could not be distinctly outlined, but was thought to be enlarged. Diagnosis, extrauterine pregnancy with hemorrhage.

Operation.—This revealed a retroverted, pregnant uterus, filling the pelvis, and softened irregularly. The tubes and ovaries were normal. The uterus was replaced and the patient recovered. The pregnancy continued and the patient left the hospital. Later she returned and aborted at the sixth month. In connection with this case, Davis mentioned that similar cases had been reported to the Obstetrical Society of Paris by Segond, Routier and Varnier.

CASE 15.—*Pregnancy with Anterolateral Flexion of Uterus.*—Reported by Fieux.[7] Patient, aged 27, wife of a physician, had had two children and one miscarriage. Menstruation was missed for two weeks, then there appeared a slight bloody flow which later changed into a considerable hemorrhage. This hemorrhage was accompanied with severe expulsive pains, and numerous pieces of tissue resembling decidua were expelled with the blood clots. Vaginal examination made at this time showed the cervix soft and widely patulous. The bloody discharge continued for ten days, at times containing membranous débris. Then everything became normal, and it was supposed that a miscarriage had taken place. Five weeks later, and three months from the last normal menstruation, a slight bloody flow again appeared. The next evening during dinner the patient was suddenly seized with severe pain in the left lower abdomen and passed into a condition of syncope which lasted ten minutes. The pulse was small, the abdomen was distended, there was some vomiting but no fever. The bloody flow ceased after a few days, but the patient continued sick and failing, and two weeks after the severe attack Dr. Fieux was called in.

Examination.—The history suggested extrauterine pregnancy and the examination confirmed the idea. There was a mass the size of a small orange just back of the pubes and to the left of the median line. The mass was round, tender on

6. Davis: Am. Jour. Obst., 1902, xlvi, 359.
7. Fieux: Med. Rev. of Rev., xi, 678.

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pressure and partially fixed. It was hard and did not undergo any change of consistence. The cervix was ruptured and displaced backward and to the right. The vaginal fornix in front and to the left was effaced by the tumor, which projected deeply into the pelvis. A deep furrow separated the tumor from the portion of the uterus accessible to the fingers, and it seemed that movement of the cervix was not communicated to the tumor. Diagnosis, tubal pregnancy (left) of about three months' duration, with slight rupture. Operation was advised and agreed to.

Operation.—This revealed a pregnant uterus, the body of which was flexed sharply forward and to the left. The corpus uteri was raised into a better position. The right ovary was removed, because of a thin-walled cyst the size of a pigeon's egg. The left appendages were normal. The patient recovered and the pregnancy proceeded to term.

CASE 16.—*Pregnancy and Salpingitis.*—Reported by Leopold.[8] Patient, aged 32, mother of five children, missed menstruation and had abdominal pains and bloody discharge. Examination showed a painful mass occupying the posterior cul-de-sac. Diagnosis, extrauterine pregnancy. Operation revealed an intrauterine pregnancy, with an associated salpingo-oöphoritis, probably of gonorrheal origin. The mass formed by the inflamed tube and ovary was low in the cul-de-sac. Patient recovered.

CASE 17.—*Pregnancy with Torsion of Enlarged Tube.*—Reported by Morel.[9] Patient, aged 32, mother of four children, missed menstruation. After a time she was seized with severe pain in the left lower abdomen, had vomiting, rapid pulse and no fever. The uterus was somewhat enlarged and softened, and a tumor was felt back of it. Operation showed a pregnant uterus with a posterior mass, as large as a turkey's egg, formed by the left tube. The pedicle of the enlarged tube was twisted six times and the interior was filled with blood (hematosalpinx).

TUMOR WITH ANOMALOUS SYMPTOMS

When a pelvic tumor, previously unrecognized, happens to be accompanied with missed menstruation and sudden pain and decided tenderness, the resemblance to tubal pregnancy may be most misleading.

CASE 18.—*Broad-ligament Cyst, with Intracystic Hemorrhage.*—Mrs. D., aged 26, admitted to the Gynecologic Depart-

8. Leopold: Monatschr. f Geburtsh. u. Gnyäk., 1905, xxi, 712.
9. Morel: Bull. et Mém. Soc. anat. de Paris, 1903, lxxviii, 863.

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ment of Washington University Hospital. Married five months. Previous menstrual history normal—menses regular in appearance, duration four days, no pain. One month after marriage menstruation was missed for seven days. Then a bloody flow appeared. It was profuse, accompanied by clots and lasted about nine days. About two weeks later the patient had a fall, which was followed by pain in the left side of the pelvis and lower abdomen, and this persisted. The succeeding months there was a menstrual flow, but it was less than the usual amount. The patient continued sick, had to give up work and was obliged to lie down at times. There was loss of appetite and for two months decided nausea when riding in a car, but this became less. There was also tenderness of the breast, which had diminished during the last month. There had been no fever. The patient complained of pain in the left lower abdomen. Temperature was 99, pulse 90, and respiration 20.

Examination.—The uterus was found forward, to the right and movable. The left side of the pelvis was occupied by a mass the size of a large orange, fluctuating and tender on palpation. The diagnosis was doubtful, with the probability in favor of tubal pregnancy.

Operation.—This revealed a parovarian tumor cyst into which hemorrhage had taken place. The cyst was easily enucleated from its bed in the broad ligament, and subsequent examination of it in the laboratory postively excluded extra-uterine pregnancy. The patient recovered without particular incident.

CASE 19.—*Parovarian Cyst with Twisted Pedicle and Salpingitis.*—Patient, aged 22, admitted to Gynecologic Department of Washington University Hospital, very ill and complaining of pains through the lower abdomen.

Examination.—A large mass was found, filling the right side of the pelvis and extending up into the lower abdomen, half way to the umbilicus. This was painful on palpation and indistinct fluctuation could be made out. The uterus was pushed to the left. All the pelvic structures were apparently bound together and fixed by adhesions. Patient was pale and complained of a constant pain in the abdomen, of a dull character. Temperature, 99; pulse, 80; respiration, 20. For ten weeks past the menstruation had been very irregular. For nearly a month there was a constant bloody discharge, then it stopped for a few days, then came on again for a few days, and then stopped entirely. For five days before entering the hospital there was no menstruation, not even a trace of blood. There was a free mucopurulent discharge. During the period

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mentioned there had been considerable pain throughout the abdomen, and two weeks before entering the hospital the patient had had a very severe attack of pain. She was confined to bed for a few days and had been lying down off and on ever since. The mass was too large and of too rapid development to be due to the inflammation, which was apparently of mild grade. There was no previous history of a tumor. There had been some pain, off and on, during the previous year, but nothing to suggest serious trouble.

The patient was kept under observation for seven days. The temperature ranged from 98 to 99.4, once going to 100, but never higher. The pulse ranged from 80 to 92. The mass continued to enlarge and the pain increased, requiring sedatives, in spite of the fact that the patient was kept absolutely quiet in bed and that the temperature continued low. There had been a tentative diagnosis of tubal pregnancy and this progress under observation and the continued absence of the menstruation tended to confirm it.

Operation.—The mass was found to be a parovarian cyst with twisted pedicle, universal adhesions and a complicating pyosalpinx of the same side. Free drainage was employed and the patient recovered.

CASE 20.—*Ovarian Tumor with Symptoms of Pregnancy.*—In a case reported by Fortun,[4] the patient presented symptoms of early pregnancy with accompanying abdominal pain and disturbance. Examination revealed that there was no pregnancy within the uterus, but that beside the uterus there was a tender mass. Diagnosis, tubal pregnancy. At operation the mass proved to be a dermoid cyst of the ovary.

A number of such cases of tumor with anomalous symptoms simulating tubal pregnancy have been reported, but it is hardly necessary to take the time to detail them here; the three cases just mentioned are typical of this class.

ABDOMINAL PAIN AND COLLAPSE

When a married woman in the child-bearing period is seized with severe abdominal pains, without apparent cause, and passes into the condition of collapse associated with severe internal hemorrhage, we naturally think of ruptured tubal pregnancy as the most probable cause. If there happens to be missed menstruation or some of the other symptoms of tubal pregnancy, and the

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examination reveals nothing else to account for the pain and shock, a tentative diagnosis of tubal pregnancy and action accordingly is certainly justified. As prompt action may be necessary to save the patient's life, such action must sometimes be taken on evidence which would be considered insufficient were the indications less urgent. Under such conditions the diagnosis of ruptured tubal pregnancy is largely a matter of exclusion. For, as previously stated, the pelvic examination often gives no definite evidence beyond the tenderness. Hence the importance of carefullly considering other conditions that may cause these symptoms. There are many such conditions, but I shall mention only certain ones which are especially liable to be confounded with ruptured tubal gestation.

CASE 21.—*Hemorrhage from Ovary.*—Reported by Royster.[5] A woman was brought into the hospital in a condition of extreme collapse, with a history of having been suddenly seized with severe pain in the abdomen, a few hours before. She presented the symptoms of internal hemorrhage and a mass could be felt in the left side of the pelvis. A diagnosis of tubal pregnancy was made. At the operation, which was carried out as soon as the patient had rallied somewhat, no tubal pregnancy was found, but instead an enlarged ovary from which the hemorrhage had taken place.

CASES 22 and 23.—*Hemorrhage from Ovary.*—Weinbrenner[10] reports two cases in which hemorrhage into a corpus luteum. already in cystic degeneration, burst the wall of the cyst. Free hemorrhage into the peritoneal cavity followed. In one instance the tendency to hemorrhage was increased by torsion of the pedicle of the cystic ovary. The clinical diagnosis in each case was extrauterine pregnancy, but microscopic examination showed positively that there was no pregnancy.

CASES 24, 25 and 26.—*Hemorrhage from Ovary.*—Pryor[11] reported three cases of acute hemorrhage into the ovary with leakage into the peritoneal cavity, producing shock, rapid pulse, general depression of the vital forces and the severe abdominal pain. He states that the condition seemed to be associated with an oncoming menstruation, as it occurred just before the menstrual time.

10. Weinbrenner: Monatschr. f Geburtsh. u. Gynäk., xxiv, No. 3
11. Pryor: Am. Jour. Obst., 1902, xlvi, 360.

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In cases of ovarian hemorrhage, care must be taken to exclude ovarian pregnancy at the site of the hemorrhage before deciding that it is due to some other condition. Some of the so-called "blood cysts" of the ovary are, no doubt, unrecognized instances of ovarian pregnancy.

CASE 27.—*Unrecognized Ovarian Pregnancy.*—Related by J. K. Kelly.[12] He operated on a woman, aged 33, for supposed extrauterine pregnancy and found only a blood cyst of the ovary about the size of a plum. The ovary was removed and the case set down as one of mistaken diagnosis. Some months later, and quite incidentally, a microscopic section was made through the wall of the little cyst, and examination of this showed chorionic villi. A careful and systematic examination was then made of the small cyst and its surroundings, and it proved to be a beautiful specimen of early ovarian pregnancy.

CASE 28.—*Ovarian Cyst with Rupture.*—Reported by Vineberg.[13] In his office he was examining a woman on account of discomfort in the lower abdomen associated with delayed menstruation. The patient was stout and the bimanual examination was difficult. The uterus was enlarged and to the left of it was a cystic mass the size of a small orange. While palpating this mass it suddenly ruptured and the patient promptly went into syncope. It was supposed that a tubal gestation sac had ruptured, with resulting intraperitoneal hemorrhage. After a little time the patient rallied and as the symptoms were then not so urgent she was kept under observation for a couple of days. Improvement was so marked that it was decided that the ruptured mass must have been only a small cyst of the ovary instead of a tubal pregnancy. There was no further trouble.

CASE 29.—*Hematosalpinx with Rupture.*—Riesmeyer[14] reported in detail a case which presented scanty menstruation succeeded by free bloody flow. Then, while the patient was sitting on a chair, she was seized with sudden, severe pain in the right side of the lower abdomen and fainted. She recovered somewhat but pelvic pain continued and she had several fainting spells.

Examination.—It was found that the cervix was soft, the uterus somewhat enlarged and there was a tender mass the size of a cocoanut filling the right side of the pelvis. The

12. Kelly: Jour. Obst. and Gynec. Brit. Emp., June, 1906.
13. Vineberg, Hiram N.: The Differential Diagnosis of Ectopic Pregnancy, THE JOURNAL A. M. A., 1901, xxxvi, 1305.
14. Riesmeyer: St. Louis Med. Rev., Aug. 4, 1908.

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case gave the impression of tubal pregnancy, though the diagnosis was somewhat doubtful, for an examination a year previous to this had shown a small lump in the adnexal region of that side.

Operation.—It was found that the mass was formed by adhesions, old blood clots and a greatly enlarged Fallopian tube filled with blood. The hematosalpinx was removed and the patient recovered perfectly. A careful microscopic examination of the hemorrhagic tube was made by Dr. Carl Fisch, who reported that the trouble was not due to tubal pregnancy, but apparently to a chronic inflammatory process.

CASE 30.—*Hematosalpinx with Severe Bleeding.*—Brettauer[15] reported a case of severe internal hemorrhage, supposedly due to ruptured tubal pregnancy. The patient went into collapse and became too weak for operation. Later she rallied and the operation was carried out. A hemorrhagic swelling, the size of a walnut, was found in the middle third of one tube. From this the severe bleeding had taken place. The inner and outer portion of the tube were apparently normal. The swollen area had the appearance of a tubal pregnancy and was excised as such. When sectioned and examined microscopically no tubal pregnancy was found. The specimen was then sectioned serially and examined most carefully and the result was absolutely negative, so far as evidence of tubal pregnancy was concerned.

The fact is sometimes overlooked that tubal swellings of hemorrhagic character are not necessarily due to pregnancy in that situation. Since Tait's famous dictum, that "hematosalpinx is always due to extrauterine pregnancy," there has been a tendency among operators to look on this as a rule without exceptions. That there are exceptions, however, there is abundant proof. A number of well-established cases have been reported. As a rule, such differentiation is not of great practical moment, for the reason that treatment of the two conditions is the same, namely, removal of the damaged tube. In some cases, however, it may be extremely important to determine certainly the character of the mass before expressing an opinion as to what it is. Such an instance came to my notice. I was not connected with the case, but was apprised of the facts afterward. Some years ago

15. Brettauer: Am. Gynec. and Obst. Jour., 1897, x, 622.

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a pupil nurse in one of our hospitals was attacked with serious abdominal disturbance requiring operation. When the abdomen was opened there was found a hemorrhagic condition of one tube resembling tubal pregnancy. The operator at once pronounced it tubal pregnancy in the presence of several internes and nurses. The information spread through the hospital with a result to be easily imagined. The young woman recovered from the serious operation only to find herself in a situation almost unbearable, and she finally left. In the meantime, examination of the mass by a competent pathologist showed that it was not a tubal pregnancy and that a most serious mistake had been made in pronouncing it such.

CASE 31.—*Tubo-ovarian Hemorrhage.*—Bovee[16] reported a case in which, at operation, there was found a tubo-ovarian hemorrhagic mass, supposed to be tubal pregnancy, but which proved to be only inflammatory. Both the tube and ovary were distended with blood, and there was a small opening through the fimbriated extremity connecting the two cavities. The hemorrhage apparently originated in the ovary, and the free intraperitoneal bleeding came through a small rupture in the wall of the ovarian blood-cyst. A thorough microscopic examination demonstrated that there was no pregnancy either in the tube or ovary.

Bovee mentioned cases of tubal and ovarian hemorrhage, not due to extrauterine pregnancy, reported by Price,[17] Newman,[18] Griffiths,[19] Briggs,[20] Croom,[21] Paul Ruge,[22] Goodell,[23] Duncan,[24] Pilliet,[25] Maurange,[26] Peuch[27] and Doran.[28] He referred also to cases occur-

16. Bovee: Am. Gynec. and Obst. Jour., 1898, xii, 593.
17. Price: Am. Jour. Obst., 1892, xxv, 338.
18. Newman: Am. Jour. Obst., 1893, xxvii, 271.
19. Griffiths: Brit. Med. Jour., 1896, ii, 1824.
20. Briggs: Liverpool Med. Chir. Jour., 1890, x, 504.
21. Croom: Med. Press and Circular, London, 1891, ii, 189.
22. Ruge: Centralbl. f Gynäk., No. 24.
23. Goodell: Am. Jour. Obst., 1890, xxi, 942.
24. Duncan: Tr. London Med. Soc., 1892 (Sajous's Ann. Univ. Med. Sc., 1893).
25. Pilliet: Ann. de gynéc. et obst., 1893, xi, 366.
26. Maurange: Ann. de gynéc. et obst., 1893, xi, 37.
27. Peuch: Gaz. hebd. de méd., 1859, vi, 40.
28. Doran: Tr. Obst. Soc., London, 1891, xxxii, 119.

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ring in virgins at an early age, reported by Fordyce;[29] to fatal cases reported by Walter,[30] Lewis[31] and Fowler;[32] to cases successfully treated by abdominal section, reported by Boldt,[33] Alloway,[34] Knaggs,[35] and Johnson;[36] and to the celebrated cases of Scanzoni in which at an autopsy on the body of a young girl, dying suddenly during menstruation, three liters of blood was found in the peritoneal cavity. These hemorrhages from the non-pregnant ovary (ovarian apoplexy, blood-cysts, follicular hemorrhage, etc.) and from the non-pregnant tube (hematosalpinx) are usually due to inflammatory changes, causing degeneration of the tissues and of the contained blood vessels. Occasionally a tumor of the ovary or tube is the causative lesion.

CASE 32.—*Hemorrhage from Varicose Vein.*—A case is reported by Manton[37] in which a severe hemorrhage took place from a ruptured vein in the broad ligament.

A number of such cases have been reported.

CASE 33.—*Salpingitis with Collapse.*—Reported by Fairbairn.[38] The patient, aged 23 and unmarried, was brought into St. Thomas' Hospital by the police, having been found in a fainting condition in the street. She quickly recovered from the faintness and was able to give the history of her illness. She had missed her menses three weeks. Menses always regular previous to this time. She admitted the possibility of pregnancy. For six days previous to the severe attack she had had pains through the lower abdomen and a bloody vaginal discharge. Then, while walking in the street, she had been seized with severe pain and had fainted, at which time she was brought to the hospital.

Examination.—Temperature, 99.6; pulse, 108; color fairly good. The abdomen was slightly distended and there was marked tenderness at the lower part. Nothing could be felt

29. Fordyce: New York Med. Jour., 1889, xlix, 180.
30. Walter: Med. Bull., Philadelphia, 1881, iii, 181.
31. Lewis: St. Louis Med. and Surg. Jour., 1888, xliv, 158.
32. Fowler: Ann. Anat. and Surg. Soc., Brooklyn, 1880, ii, 67.
33. Boldt: Ann. Gynec. and Pediat., 1890-91, iv, 6.
34. Alloway: Montreal Med. Jour., 1893-4, xxii, 679.
35. Knaggs: Tr. Obst. Soc., London, 1893, xxxv, 213.
36. Johnson: Tr. Soc. Alumni, Bellevue Hosp., New York, 1896, p. 137.
37. Manton: Tr. South. Surg. and Gynec. Assn., 1900.
38. Fairbairn: Jour. Obst. and Gynec., Brit. Emp., 1907, xii, 451.

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on bimanual examination. The history and tenderness without other apparent cause, pointed to tubal pregnancy, and that diagnosis was made and the patient operated on accordingly.

Operation.—No tubal pregnancy was found, but instead double salpingitis with both tubes leaking pus into the peritoneal cavity. Both tubes were removed. The patient recovered. A most deceiving feature of the case was the low temperature, always below 100. Microscopic examination failed to show any bacteria in the pus, but the belief was expressed that the inflammation was gonorrheal in character.

CASE 34.—*Ruptured Appendix and Pelvic Tumor.*—Reported by Ford.[39] At about the seventh week of supposed gestation the patient was seized with abdominal pain which was so severe that she fainted and fell, and went into collapse in a toilet room. She revived somewhat, but while undergoing examination she fainted again. A diagnosis of ruptured tubal pregnancy was made and Dr. Ford was called in consultation. He found a small ovarian tumor and considered that the acute symptoms were due to torsion of the pedicle. At operation, an ovarian tumor was found but there was no torsion of the pedicle. The acute symptoms were due to perforative appendicitis, with surrounding pus and adhesions.

CASE 35.—*Fulminating Pelvic Edema.*—Reported by Briggs.[40] A married woman, whose menstruation had been normal, came complaining of malaria and some pelvic pain. Pelvic examination showed nothing abnormal except a slight fulness about the left adnexa. Two days later the patient returned to the office, very sick. Her face was pale and pinched and anxious; pulse 120, small and weak; temperature, 100. The pelvis was then completely filled with a fluctuating mass. The rapid development of the mass with almost no fever, pointed to hemorrhage as the cause, and a diagnosis of tubal pregnancy was made. At the operation the pelvis was found filled with small cysts of various sizes, formed by collections of serum within the connective tissue. There was no tubal pregnancy. The pelvis was drained and the patient recovered.

CASE 36.—*Fulminating Pelvic Edema.*—Reported by Briggs.[40] Patient's menstruation was delayed four days, then came on scanty and was accompanied by paroxysmal pains which caused the patient to think she was having a miscarriage. After some days the pain became more severe and the

39. Ford: Am. Jour. Obst., 1902, xlvi, 361.
40. Briggs, Wallace A.: Fulminating Pelvic-Abdominal Edema Simulating Ruptured Tubal Pregnancy, THE JOURNAL A. M. A., Feb. 15, 1908, l, 528.

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patient had two fainting spells. Temperature was normal, pulse 90 and small and compressible. The abdomen was sensitive. Sedatives were given which diminished the pain, but the shock increased. The radial pulse became imperceptible and the skin and mucous membranes were markedly anemic. The uterus was enlarged, retroverted, fixed and sensitive, adnexa not felt. Liquid could be demonstrated in the flanks. Diagnosis, tubal pregnancy with rupture.

Operation.—The pelvis and lower abdomen were filled with great blebs due to the collection of serum in the connective tissue, causing the peritoneum to pouch into the pelvis from all directions. Both tubes were chronically inflamed and the right ovary was enlarged and cystic.

The patient's condition continued bad and she died some hours after the operation. The feature of the case was the enormous amount of serum pocketed in the connective tissue, without any evidence of recent inflammation.

CASE 37.—*Fulminating Pelvic Edema.*—Reported by Legueu and mentioned by Briggs.[46] Shortly after a normal menstruation, patient was suddenly attacked by violent pelvic pain accompanied by syncope, extreme pallor and cold extremities. The abdomen was distended, hard and painful to pressure. Vaginal examination disclosed a fluctuating mass in the cul-de-sac. Diagnosis, retrouterine hematocele. On opening the abdomen a quantity of yellow serum escaped. There were large collections of serum in the tissues about the right adnexa, aggregating a pint. The patient recovered. Examination of the serum showed only leucocytes and peritoneal cells.

CASE 38.—*Fulminating Pelvic Edema.*—Jocet's case, mentioned by Briggs.[46] Patient, aged 28, married eight years, no children, had, on three separate occasions, an attack of severe abdominal pain accompanied by an accumulation of fluid in the right iliac fossa, which presented the characteristics of hematocele. Twice the mass terminated by resolution and the patient was perfectly well in the intervals. The third time, after the usual symptoms of the supposed hematocele had continued some weeks with improvement, the patient was suddenly seized with violent abdominal pain, accompanied by pallor, anxious facies and incessant vomiting. The mass enlarged and there developed features that pointed to inflammation rather than hemorrhage as the cause of the trouble. Operation showed the pelvis filled with encysted collections of serum, and finally, deep in the pelvis, there was found an old ovarian abscess, which was evidently the exciting cause of the surrounding edema.

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The cases of fulminating pelvic edema present a puzzling problem in etiology and in diagnosis. The following case, though not mistaken for tubal pregnancy, illustrates the startling suddenness of the development of the trouble and the obscurity of the cause.

CASE 39.—*Fulminating Pelvic Edema.*—Last year I was called in consultation by Dr. S. T. Bassett of St. Louis, to see a patient with pelvic disturbance. It was Sunday; the patient had attended church in the morning feeling fairly well, but while there became very sick and could scarcely get home. She had a chill, followed by severe headache and general aching, but no localizing symptoms. There was no apparent local trouble in any part of the body to account for the fever, which rose to 105.5. By evening there was evidence that the pelvis was the seat of the disturbance and I was asked to see the patient.

Examination.—I saw her about 10 p. m. The temperature had been reduced to 104. The pulse was rapid but of fair volume. The pelvis was filled with a tender mass which surrounded the uterus and fixed it firmly. There seemed to be acute pelvic inflammation with extensive exudate. But there was no apparent cause, either recent or remote. The patient had always been rather nervous and this had been somewhat worse of late, but there had been no symptoms indicating pelvic disease of any kind. The next day the temperature was 104.2, pulse 120, respiration 28, and there was much peritoneal irritation. Operation at once was indicated, to check the rapidly progressing inflammation, if possible, and accordingly the patient was taken to the hospital.

Operation.—When the abdomen was opened the pelvis was found filled with small encysted collections of fluid involving the tubes, ovaries, broad ligament and uterus. The cysts or pseudocysts were of various sizes, were filled with clear serum and seemed to extend deeply into the substance of the organs involved. From the appearance, I suspected hydatid disease. I removed all the cysts that it was feasible to remove and then drained the pelvis through the abdominal incision.

The temperature dropped within a few hours to 98 and it did not again go high. During the first part of the period of convalescence it ranged from 99 to 100.2, and later dropped to normal, where it remained. The wound and drainage tract healed rapidly and the patient had a smooth convalescence. Laboratory examination of the tissues removed showed no bacteria of any kind, no evidence of hydatid disease, and no spe-

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cific pathologic process that would adequately account for the alarming symptoms and the marked tissue change. It was evidently a case of fulminating pelvic edema.

REMARKS

From the thirty-six cases above mentioned which simulated tubal pregnancy the following practical conclusions may be drawn:

1. Gonorrheal pyosalpinx, after the acute symptoms subside, may lie dormant and unsuspected for a long period (four years in one case reported above). During this quiescent period the pus-tube (containing sterile pus usually) is tolerated the same as a small tumor or other non-irritating body—the patient being practically well and without decided pelvic disturbance.

Such a quiescent pus-tube may at any time give rise to an acute exacerbation, and the onset of the pain may be so sudden and apparently causeless as to suggest tubal pregnancy. This suggestion is strengthened by the continued enlargement of the mass (from irritative exudate) without decided fever (for the pus is sterile). Accompanying the exacerbation or preceding it there are sometimes other symptoms that we associate with tubal pregnancy, viz., missed menstruation, stomach disturbance, tenderness of the breasts, and softening of the cervix uteri. The last three are accounted for by the peritoneal and periuterine irritation and congestion, but why there should be delayed or missed menstruation at this inopportune time I do not know. One would suppose that the irritation and pelvic congestion would cause the menstrual flow to be excessive rather than absent. It is possible that the temporary suppression of menstruation (from some nervous disturbance or other obscure cause) stands in a causative relation to the acute exacerbation with its subsequent symptoms. I offer this simply as a suggestion toward a possible explanation of this strange and misleading sequence of events (the missed menstruation followed by the other symptoms detailed).

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In cases of supposed tubal pregnancy of the type mentioned particular care should be taken to exclude chronic gonorrheal salpingitis, as follows: (a) by inquiring into the patient's history for evidences of specific vaginitis or urethritis and for subsequent pelvic symptoms (an inquiry into the husband's history also may bring out valuable information); (b) by a careful examination for evidences of a chronic urethritis, Bartholinitis, endometritis or salpingitis; and (c) by staining for the gonococcus any suspicious discharge that may be obtained from the urethra, vulvovaginal glands, uterus or vagina. In chronic cases negative findings do not exclude gonorrhea, for the gonococcus disappears from the discharge after a time.

2. In rare cases acute gonorrhea may extend rapidly through the uterus to the tubes and peritoneum, with so little disturbance of the vagina and vulva as to arouse no suspicion of its presence. In such a case the acute peritoneal symptoms will come on suddenly and without apparent cause. If there happens to be also delayed or scanty menstruation, tubal pregnancy may be suspected. And this suspicion is strengthened by the stomach disturbance, the softening of the cervix and the enlarging mass beside the uterus. In my case above mentioned the diagnosis was further obscured by the curettement, which modified the discharge, and by the continued low temperature, which seemed to exclude acute inflammation. In all such doubtful cases with acute discharge it is advisable to examine for gonococci, even though the discharge be scanty and bloody and apparently non-purulent.

3. An early miscarriage, if associated with a tumor or followed by mild salpingitis, may very closely simulate tubal pregnancy. Membranes may be passed in either condition. With a miscarriage there is an embryo, but it often passes unnoticed. If a shred of tissue is passed it may be examined for chorionic structures. In a case which can not be decided otherwise, curette-

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ment is advisable to obtain tissue for microscopic examination for chorionic villi. But in suspected tubal pregnancy such a curettement should not be carried out until the patient is in a hospital and prepared for abdominal section, for the manipulations may start internal hemorrhage, requiring operation at once.

4. A pregnant uterus may present very misleading conditions: e. g., irregular softening (so much so that the body seems to be a firm mass entirely separate from the cervix), displacement, backward or forward or laterally; hyperesthesia with displacement or irregular softening or an associated lateral mass (salpingitis, etc.). If there is in addition an anomalous history, a mistake is quite probable.

5. An unsuspected tumor in the pelvis may give rise suddenly to severe disturbance, and if there happen to be present also some of the symptoms of early pregnancy, a diagnosis of extrauterine pregnancy is very probable. The cases mentioned above show that the early symptoms of pregnancy (missed menstruation, stomach disturbance, breast tenderness and softened cervix uteri) often appear without satisfactory cause and at most inopportune times.

6. Ovarian hemorrhage or tubal hemorrhage, due to other conditions, may so closely simulate extrauterine pregnancy as to be indistinguishable before operation, and in some cases the matter is in doubt even after direct exposure and handling of the affected structures. In this connection there are three points to be kept in mind: A. There may be slight hemorrhage from the tube or ovary, particularly at the period of menstrual congestion, not due to extrauterine pregnancy and not requiring operation. B. In cases of tubal hemorrhage requiring operation the hemorrhagic condition of the tube is not necessarily due to pregnancy, and in doubtful cases should not be pronounced such until after confirmation by microscopic examination. C. In a hemorrhagic condition of the ovary requiring removal of the

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same; a careful examination should be made to determine exactly the pathologic condition. Such a supposed simple "blood cyst" of the ovary may prove on careful microscopic examination to be an early ovarian pregnancy.

7. Salpingitis, appendicitis and perforations in the gastrointestinal tract may, in rare cases, come on so suddenly and progress so rapidly as to suggest internal hemorrhage from extrauterine pregnancy. Usually in these conditions there are preceding or accompanying symptoms which point to the true nature of the disease. If these distinctive features are absent and there happen to be some of the other symptoms of tubal pregnancy, a mistaken diagnosis is probable.

8. Fulminating pelvic edema with its sudden onset and the rapid development of alarming symptoms may closely resemble extrauterine pregnancy. In my own case, above cited, the temperature was so high that it was easily distinguished as an inflammatory trouble and not a hemorrhage, but in other reported cases this feature was lacking and mistaken diagnoses of extrauterine pregnancy were made. In this, as in other conditions of non-hemorrhagic shock or depression, there is not the persistently blanched condition of the skin so characteristic of profuse hemorrhage. The pulse, also, though rapid, is likely to have better volume than after a severe hemorrhage.

9. It is evident that the diagnosis of extrauterine pregnancy must rest on the combination of several symptoms. No one fact is sufficient, and it is hazardous to depend on two or three facts unless they are especially strong and well-marked. In most cases the diagnosis must be reached by a careful consideration of all the symptoms present and the definite exclusion, one by one, of other conditions which may produce similar symptoms.

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EXTRAUTERINE PREGNANCY WITH ESPECIAL REFERENCE TO THE PROPER OPERATIVE PERIOD AFTER TUBAL RUPTURE

WITH REPORT OF CASES

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There are few conditions in the practice of medicine and surgery that commands greater care and skill in diagnosis than that of extrauterine pregnancy. A physician may practice months and even years without the occurrence of a case, but I dare say, ere long, he will meet the condition when he least expects it. The vital importance of diagnosis can not be too greatly impressed on our minds, because in many cases failure of diagnosis means a fatal result to the patient.

The general practitioner usually sees these cases in their beginning. On him rests a grave responsibility and, indeed, he should not bear it alone. Surgical counsel may reassure the diagnosis and save the life of the patient by proper surgical intervention. This is not to reflect on the diagnostic ability of the general practitioner, as in such a tragic condition the surgeon acquires that alertness and acuteness in diagnosis which necessarily follow the greater frequency of contact with these cases.

A positive diagnosis of extrauterine pregnancy before rupture has been rare. It is one of those conditions in which a few positive diagnoses have been made, many probable ones have been made, and a great many never

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have been made until after the abdominal cavity is opened. I am convinced, however, that there are many instances in which strong presumptive diagnosis should have been made, and in which the patient is allowed to pass from observation to suffer the unfortunate results of the physician's carelessness. No pelvic examination should ever be made without keeping clearly in mind the clinical features of the salient conditions, in their incipiency, which effect the genital tract.

Most cases of ectopic gestation do not come under the physician's observation before rupture. Some of the cases in which there is an opportunity to question before the tragic occurrence, however, give a typical history that should lead one to be very suspicious of abnormal pregnancy.

The majority of patients have had children, but usually a long time has elapsed since the birth of the last child. Interrogating the patient with reference to previous pelvic disease may determine the existence of salpingitis or some pelvic distress.

The subjective symptoms of ectopic are not infrequently like those of normal pregnancy. There is usually a cessation of menstruation for one or more periods, though in many cases there is no omission of this function, the last one frequently being more profuse and of longer duration, or less in amount and shorter in duration than normal. In case there is a cessation of menstrual flow, it is usually re-established, irregular as to time, of a tarry, smeary and sticky character, which, according to some observers, is pathognomonic. The pain is usually of a cramp-like character, occurring at intervals for several days or weeks, doubtless owing to an effort on the part of the tube to rid itself of a foreign body. There is, as a rule, following the colicky pain, a dark sanguineous discharge, in all probability due to a partial rupture of the gestation sac. If microscopic examination is made, decidua is found in the majority of cases.

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While it is of extreme importance to obtain a careful history, the information is enhanced markedly in value by a careful and thorough examination. Indeed, I am almost convinced that thoroughness is the rule and carefulness the exception. Until the possible diagnosis of ectopic gestation can be eliminated in which where its presence is strongly suspected, the pelvic examination should be made with great gentleness to prevent rupture by the examining finger. I can not imagine a more frightful experience to occur in a physician's office, where such cases are frequently first examined, than to rupture an impregnated tube. Not infrequently such cases are reported.

There is usually a turgescence of the external genitalia noted, as in normal intrauterine pregnancy. The cervix is soft and the os patulous. The uterus is enlarged and may be displaced in accordance with the size of the tumor. The tumor mass is variously located, usually to one side or maybe behind the uterus, or may even be anterior to this body. It is doughy in consistence and fixed to some degree, depending on the duration of gestation. Contrary to the statements of many observers, the exquisite tenderness in the majority of cases that I have examined has not been elicited, and in some cases little or no tenderness was complained of.

The whole aspect of the case changes following rupture. Here the history is of some value, which one may be able to obtain with difficulty. The symptoms of the attack in conjunction with the pelvic examination, however, will make the diagnosis a comparatively easy one. What is a more characteristic clinical picture than a sudden, sharp, agonizing, abdominal pain, severe enough to make the patient faint, provoked by a misstep or slight exertion, and accompanied by nausea, vomiting and collapse? The thirst, subnormal temperature and extreme restlessness of the patient will usually guide one to a correct diagnosis of internal hemorrhage. Slight abdominal rigidity and tenderness is noted subsequent

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to rupture, due to peritoneal irritation from the clot. Bimanual examination will reveal an ill-defined fulness behind the uterus.

With such an array of signs and symptoms as enumerated, a positive diagnosis of ectopic gestation should be made without hesitancy on the part of the examining physician.

In a large number of cases the sudden pain and collapse are the first signs of abnormal pregnancy. Then, again, there may be a soreness or a sense of distress in one or the other of the ovarian quadrants, only to be followed on the slightest physical provocation by the characteristic pain and signs of internal hemorrhage, which delivers the patient at the threshold of death in a very few hours if proper treatment is not administered. The history of pelvic disorder or a long interval of sterility may be wanting. If the examination for decidua is made, its absence may leave one in doubt, even though it is found in only a little more than half the cases. One is likely to be misled in diagnosis by the premonitory symptoms of ectopic pregnancy, following a very recent menstruation, which is frequently but of a few days' duration. Under all circumstances, however, the physician's suspicions should be aroused and the patient kept under close observation.

The condition from which one commonly has to differentiate extrauterine pregnancy are salpingitis, appendicitis and uterine abortion. I believe that the diagnosis of salpingitis should not leave one long in doubt in most cases. The early increased temperature, denoting infection, the usual bilateral involvement, the extreme tenderness and fixation, the absence of early signs of pregnancy and sanguineous discharge from uterus should calm one's anxiety so far as extrauterine pregnancy is concerned. In appendicitis local symptoms are usually confined to the iliac fossa; leucocytosis is present and the pain is usually first located in the region of the

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umbilicus, later general and finally localized at McBurney's point associated with tenderness and rigidity.

Uterine abortion, it must be admitted, leaves one frequently in doubt as to the real nature of the condition. The history may be of some value in some cases in which abortion has been induced. The attack is less sudden and the pain less severe than in ectopic gestation; the ovum may be noted in the discharge from the uterus; on pelvic examination there is usually dilatation of cervix especially if secundines remain in the uterus; a mass laterally placed or an ill-defined fulness behind the uterus is absent; the symptom-complex of loss of blood is late, as compared to that of internal hemorrhage from rupture of tube; frequently, especially if there is sepsis, there is a high temperature. While it may seem expedient in exceptional cases to curette the uterus for purpose of diagnosis, I believe that it is the consensus of opinion that this is bad practice.

The positive etiology of ectopic gestation is still a matter of speculation. Possibly no one condition operates in its production, but the combination of many conditions is the rule. One of the most frequent predisposing factors is probably salpingitis, which causes the destruction of the ciliated epithelium of the tube, increases the connective tissue and produces attachment of the tube by adhesion, thereby interfering with peristalsis, and distorts and completely obstructs its lumen. The impregnated ovum may lodge in a diverticulum of the tube in its passage to the uterus. Pressure from without may cause tubal obstruction as from uterine fibromas or tumors of the broad ligament. An attenuated tube of fetal type is regarded as a cause in some cases. Whatever may be the most constant predisposing or positive factors at work in the causation of extrauterine pregnancy, it is evident that prophylaxis has little to support it in an attempt at lessening its occurrence.

The passage of the ovum may be arrested at any point from the ovary to the uterus. The possibility of an ova-

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rian pregnancy has led to a great deal of discussion.

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rian pregnancy has led to a great deal of discussion, with the general opinion that it rarely occurs. Spiegelberg says that "the following conditions must be met before we can make a positive diagnosis of a given case of extrauterine pregnancy being ovarian: 1. The tube on the affected side must be intact. 2. The fetal sac must occupy the position of the ovary. 3. It must be connected with the uterus by the utero-ovarian ligament. 4. Definite ovarian tissue must be demonstrated in its wall."

The fact that, in certain cases of tubal and broad-ligament pregnancy, the ovary may be flattened out so as apparently to occupy a part of the wall led Williams to modify the fourth condition, stating that ovarian tissue should be found in a number of places in the sac wall at some distance apart. Tubal pregnancy is the most common variety of ectopic gestation; as the tube is divided into the ampullar, isthmic and interstitial portions, tubal pregnancy is accordingly defined as ampullar, isthmic and interstitial, frequency being in the order named.

It is the general belief that the existence of a primary abdominal pregnancy has yet to be demonstrated. In reality, abdominal is probably secondary to tubal pregnancy. According to the work of Martin and others, the ovum can become implanted on a thin strip of tubal tissue which extends from the fimbria to the ovary. It is obvious that such cases may be recognized as abdominal pregnancy when really they are of tubal origin.

It was formerly supposed that tubal abortion rarely occurred, but according to statistics it is the most common termination of tubal pregnancy. Martin asserts that tubal abortion is the rule, and that in only exceptional cases does the tube rupture into the peritoneal cavity, this occurring when the fimbria is closed, which prevents tubal abortion. In three of my cases reported in this paper the patients aborted in like manner.

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In case of a small embryo being extruded into the peritoneal cavity, there is no doubt that in many cases absorption takes place. Not infrequently, too, absorption of embryo has taken place in the tube, evidences of which have been discovered at operation or postmortem examination. After the fetus has reached a larger size, absorption would be impossible; it then undergoes one of several changes; it may become mummified, the liquid contents of the embryo being absorbed and nothing remaining of the fetus except the bones covered with loose shriveled skin. If suppuration takes place the patient usually dies from sepsis unless the pus is evacuated by rupture or drainage. In some instances there is a deposition of lime salts within the fetus and membranes, converting them into a lithopedion. Very rarely the fetus is transformed into a greasy, yellow mass known as adipocere.

It is universally considered that the treatment lies entirely within the domain of surgery. The time of this procedure after rupture, however, has provoked heated discussion among eminent authorities of wide experience.

As to the proper treatment in a certain class of cases, there is little diversity of opinion. In those cases in which a positive or a strong presumptive diagnosis of ectopic gestation has been made before rupture, the advisability of immediate operation is corroborated by the experience of all observers. Then, too, we frequently have to do with patients who have suffered mildly from the symptoms of internal hemorrhage unquestionably following many cases of tubal abortion. Certainly there is no contraindication to prompt operative interference in these cases. Haste, however, should not lead us to omit any measure necessary for the proper performance of the operation.

The question of immediate operation after rupture of the tube while the patient is in shock, or of deferring this procedure until reaction is thoroughly established,

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is as yet far from being settled. Each of these procedures has many ardent supporters, the majority being in favor of performing abdominal section without delay. My experience with these cases leads me to join the ranks of the minority.

Death from primary hemorrhage *per se* following rupture of the tube is rare; otherwise there would be many more postmortems than operations performed on these cases. In what percentage of cases has active hemorrhage been positively found on exploring the peritoneal cavity? This point has not been sufficiently investigated to be dogmatic, but I am of the firm belief that active bleeding is rarely found at time of operation. Moreover, unless there is positive evidence that active bleeding is present, I am of the opinion that in most cases hemorrhage has ceased even before the patient is examined by a consultant.

Is it justifiable to perform an immediate major operation in such cases while the patient is *in extremis* when 95 per cent. (Robb) of all patients of several observers recover from the primary hemorrhage? It seems to me that there is everything to lose and little to gain by such a procedure in a large percentage of these cases. The additional shock brought about by moving the patient to the hospital is always evident; if hospital is not accessible, the active preparation at home and the unsurgical surroundings lessen the patient's chances of recovery. The inability to secure the prompt service of a skilful operator, the prolongation of operation by a surgeon with little experience and the additional anesthetic, will frequently decide the unfortunate fate of the patient. The removal of intra-abdominal pressure before reaction is established, I am convinced, frequently causes the patient to bleed to death into her abdominal vessels.

By deferring operation after the rupture of the tube the patient is allowed to react from the immediate effects of shock, when the operation can be performed with greater safety. During this period the patient

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should be kept under close observation and quiet, head low, given morphin if restless, little stimulation and ice-cap to abdomen and heat to the extremities. One is thus able also to take every precaution in preparation of a patient, minimizing the possibility of infection, which is the second most frequent cause of death. The administration of ether is not then a decided disadvantage. The equilibrium of blood-pressure between the abdominal and the peripheral circulation, so to speak, has been re-established; whereas the sudden relief of intra-abdominal pressure on section has but little deleterious effect on the patient after a reasonable delay. The prime purpose of surgical procedure is the assistance it lends to Nature in the saving of life. Consequently I believe that by following the plan suggested one does everything to aid Nature's own efforts and positively nothing to defeat her purpose.

The period of delay is a matter to be decided by the condition of the patient. Certainly no unnecessary delay should be allowed and usually forty-eight hours is sufficient time for a patient to revive from shock. We would certainly be at fault if we deferred the operation too long, thus inviting further complication.

In my opinion, vaginal puncture should not be made except in those cases in which infection has developed, requiring continuous drainage. The sudden relief of intra-abdominal pressure produced by vaginal puncture, while the patient is in shock, aggravates the condition. If vaginal puncture has been made instead of abdominal section, it is impossible to supply the loss of intra-abdominal pressure by the immediate introduction of normal salt solution into the peritoneal cavity.

Following abdominal section I invariably fill the peritoneal cavity with salt solution in cases in which the patients are suffering at all from shock of a recent ruptured tube. By such a measure the intra-abdominal pressure is supplied; it is gradually lessened by the process of endosmosis; besides, the salt solution has a physiologic value.

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CONCLUSIONS

1. Early diagnosis is the greatest factor in the saving of life.

2. In cases of sudden pelvic distress during the child-bearing period, the physician should always keep in mind the possibility of ectopic gestation.

3. In case of suspicion of an abnormal pregnancy, counsel should be immediately sought to clear the diagnosis if possible.

4. Operation should be performed immediately in cases in which rupture has not occurred and in cases in which the hemorrhage has not produced much shock.

5. In cases in which there is severe shock, I believe it to be good practice to wait until the patient has revived from same.

6. I do not, as a rule, advise waiting more than forty-eight hours.

7. I believe vaginal puncture to be bad practice in these cases unless infection requires continuous drainage.

8. Physiologic salt solution is of value in cases of shock (1) to maintain intra-abdominal pressure so as to equalize the circulation; (2) for its well-known physiologic effect.

BIBLIOGRAPHY

1. Getty, S. E.: New York Med. Jour., 1904, lxxxvi, 1117.
2. Kelley, H.: Med. Gyn., 1908.
3. Randal, W. H.: Am. Med., Philadelphia, 1906, xi, 102.
4. Herman, G. E.: Brit. Med. Jour., 1904, i, 61-64.
5. Ross, J. A.: Brit. Med. Jour., 1906, ii, 1209-1213.
6. Hirst, B. C.: Obstetrics, 1903.
7. Marshall, G. B.: Glasgow Med. Jour., 1904, lxii, 91-103, Disce. 125.
8. Brothers, A.: Med. Rec., New York, lxvi, 533-536.
9. Storer, M.: Boston Med. and Surg. Jour., 1904, cl, 5-9.
10. Robb, Hunter: Am. Med. Jour., ii.
11. Wood, Ralph: Arch. Diagnoses, 1908, i.

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ABSTRACT OF DISCUSSION

ON PAPERS BY DRS. CROSSEN AND BOWERS

Dr. C. W. Barrett, Chicago: I agree in the main with these papers and am strongly on the side of operative treatment at the time when the patient's life is in danger from hemorrhage. I am interested in the diagnosis of extrauterine preg-

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nancy because in a large charity hospital with which I am connected the cases if diagnosed come to the surgical obstetrician, and if undiagnosed they go to the general surgeon and the surgeon gets most of them, for usually they are not diagnosed. Dr. Crossen lays down definite points in differential diagnosis which are to be followed in the main. The differential diagnosis may not be of the highest practical importance in the most doubtful cases, because almost any one of these conditions requires active operative interference. There is good reason for the difficulty of diagnosis between gonorrheal infection resulting in gonorrheal salpingitis and extrauterine pregnancy, because in about 75 per cent. of the cases the patient with extrauterine pregnancy has had gonorrheal infection and frequently a well-marked pus tube is found on the opposite side. In making a diagnosis of extrauterine pregnancy, we are often led to say that we should have a previous history of sterility. One of my internes said the other day: "This looks like extrauterine pregnancy, but it is not, because there is no history of previous sterility. That which is more important is history of previous pelvic disease." In most of the cases of extrauterine pregnancy the patients have a stormy pregnancy up to the time of rupture. Primary rupture may be only partial; first into the tube and later into the peritoneal cavity. This has an important bearing on treatment.

The second speaker laid stress on early diagnosis, even to the extent of sending for an expert to make the diagnosis, and he recommended operation in all patients who could possibly wait, and then insisted on delaying those cases in which the patient is actually dying because a blood vessel is leaking. It is said that the bleeding patients do not die; that hemorrhage ceases short of death. Robb operated on thirty-two dogs to show that women do not die from rupture of extrauterine pregnancy. Most of those dogs were not even pregnant dogs. Conditions were altogether different. He went on to show that the patients operated for extrauterine pregnancy did not usually have the amount of blood in the abdominal cavity that a dog can lose and still live. It matters little about the amount of blood in the abdominal cavity found post-mortem as proof against the fact that the woman is dead. Women die now and have died in previous years from the cause and that has emphasized the importance of early diagnosis of extrauterine pregnancy and early action in these cases. In the class of cases in which Robb and others urge that operation be defered because the patient is in shock, it is of the utmost importance that the patient be operated on immediately. A certain percentage of these women will die if they are not operated on, and they must be operated on early. No one can say when hemorrhage has stopped in extrauterine pregnancy

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or if stopped when it will recur. Rupture is often only partial and the patient may have another hemorrhage causing death.

Dr. Edward A. Schumann, Philadelphia: With regard to this, to my mind, pernicious teaching of deferred operation, I wish to say that I had occasion to bring down for the scientific exhibit twenty specimens of ectopic pregnancy from the Gynecean Hospital of Philadelphia. Of these twenty specimens, three are post-morten; one because operation was refused; two because the patients lived in the country where the surgeon could not reach them quickly enough. The inference is obvious and need not be enlarged on.

Dr. Ross McPherson, New York: I want to speak in favor of immediate operation. At the New York Lyin-in Hospital there are many cases of ectopic gestation and the patients usually have been treated for a considerable period of time before they get to us; that, is they are in pretty severe shock and in bad condition when they come in. It has been our custom to operate in all cases as soon as the diagnosis is made, believing that shock is mostly due to hemorrhage, and that with a patient having hemorrhage, shock is not going to lessen until hemorrhage has ceased. Our results are excellent. Most of the patients recover. I do not believe any man can say just when a hemorrrhage has stopped and when it has not in these cases in which there is a marked amount of symptoms. I think it is important to get into the abdomen and to get out quickly. It is not an operation that requires a great deal of time if the operator is fairly rapid. The operation should be done in twelve or fourteen minutes, and thus it is possible to save patients who otherwise would have died. If we wait for forty-eight hours the woman may die, and after she is dead it does not make a bit of difference about treatment, so far as the patient is concerned. The theory of waiting may be all right, but I do not believe it pays, and the sooner we operate on these patients and stop the bleeding, the better for our patients. I think that is good surgery.

Dr. John Osborn Polak, Brooklyn: Twice in the last year I have seen hemorrhages which had ceased reproduced by examination of the patient while under anesthesia on the operating table. Examining a patient under an anesthetic in supposed ectopic gestation is always dangerous and unsatisfactory, as it tends to increase the rupture and the amount of hemorrhage. These patients supposed to have extrauterine pregnancy, should never under any circumstances be stimulated. Morphin in large doses relieves the restlessness and is the best stimulant that we have. It should be given in doses of from ¼ to ½ grain, instead of the usual stimulants commonly employed by the general practitioner. The immediate operation in my hands has been followed by satisfactory results. In 81 cases in the Williamsburgh, Methodist and Jewish hos-

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pitals, I have lost but 2. These patients were septic at the time of admission. Patients are usually operated on immediately, however, if the pulse is below 100 and the patient's general condition is good, the operation is often deferred until the next regular clinic day, say twenty-four or forty-eight hours. When the operation is deferred, patients are put in the elevated foot posture, the blood-pressure taken every four hours, and morphin given by the rectum. If the blood-pressure shows a drop, they are operated on immediately. Regarding treatment by infusion, these women are suffering from a loss in the volume of the blood, as well as a lowered hemoglobin and the consequent air hunger. If we fill the blood vessels up with saline solution, the air hunger is more marked. They will die of pulmonary edema, because the heart is not capable of handling the suddenly increased volume of serum. If the saline solution is injected into the abdominal cavity, not only is the intra-abdominal pressure restored, but the heart and circulation accommodate themselves to the new condition of things and the circulation takes what solution is needed, as it can handle it; and the adjustment is better and the air hunger much less marked than in the patients in whom it was infused.

Dr. C. A. Stillwagen, Pittsburg: Without entering into any of the arguments for or against deferred operation, I wish to state my experience so far as it has gone. I have deferred the operation now almost fifty times without mortality and without mortality from subsequent operation. In a number of these cases the hemoglobin has been as low as 20 per cent. and the red blood cells under 2,000,000. While I know it seems unsurgical to allow a patient to go on if she has a bleeding vessel, it is just as hard to diagnose that the vessel is bleeding as that it is not, and so far as experience justifies us in deferring operation, I think we are right in doing so. In the light of my experience I would not feel justified in operating on a patient *in extremis*.

Dr. Emil Novak, Baltimore: This seems to be developing into an experience meeting. I have not had so large an experience as some others, but I have had some. The last speaker mentioned 50 cases in which operation was deferred without any evil results. Although my series is not nearly so large, I have seen 2 cases in which the operation was unintentionally deferred because of delay on the part of the general practitioner who first saw the case, and in each instance the patient died. I was glad that Dr. Barrett emphasized so forcefully the dangers of delay in operating in these cases of ectopic pregnancy. It does seem a very unsurgical teaching, and a very dangerous one, in view of the fact that many general practitioners would get the idea that ectopic pregnancy when ruptured need not be operated on immediately, and would therefore put off sending their patients to a hospital.

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The question of the treatment of ectopic pregnancy is in many ways analogous to the treatment of appendicitis. I have no doubt that many men could put off operating on appendicitis and still be able to present comparatively good statistics; but sooner or later, however, they are bound to meet with disaster. I was also glad that Dr. Barrett emphasized the importance of gonorrheal infection as a cause of ectopic pregnancy. Most of us believe that ectopic pregnancy can usually be traced to pre-existing pelvic inflammation. The difficulty of distinguishing between pelvic inflammation and ectopic pregnancy is a very important point, not only in the ordinary form of salpingitis, but also in the diagnosis between a gonorrheal abscess and hematocele. It is not an infrequent finding to open up a supposed pelvic abscess and to find a hematocele instead. For this reason I do not believe that a pelvic abscess should be opened unless facilities are at hand for performing abdominal section if necessary.

Within the past year I have had the difficulty of distinguishing between early miscarriage and ectopic pregnancy. A woman of 22 missed one menstrual period, and a few weeks later developed a persistent slight bleeding. The uterus was moderately enlarged and an elastic mass was felt in the left side of the pelvis. A presumtive diagnosis of ectopic pregnancy was made. At operation the mass was found to be nothing more than an ordinary ovarian cyst. This was removed, the uterus curetted and decidual tissue found. The case was nothing more than an incomplete abortion of an intrauterine pregnancy associated with an ovarian cyst. In connection with the urgency of operation as emphasized by Dr. Barrett, I recall two cases. The first was of particular interest in that it was one of interstitial pregnancy. The patient was a colored woman about 28 years of age, who was attacked about the middle of the day with severe pains in the abdomen. She sent for her physician, who examined her and gave her some "colic" medicine. He did not examine her vaginally. She became much worse and again sent for the doctor, who did not respond until 6 o'clock in the evening, when she had become practically moribund. Then, realizing her precarious condition, he sent her to the hospital, where she died before any preparation could be made for operation. There was a tremendous ragged, gaping hole in the horn of the uterus, This case was reported to the American Gynecological Society in Washington, about two years ago, by Dr. Moseley. The second case was that of a woman who was sent to the hospital soon after the development of symptoms, but who died before reaching the hospital. The condition in this case was one of early rupture of a tubal pregnancy of the ordinary variety.

Dr. A. E. Benjamin, Minneapolis: One important point is the necessity of educating the general practitioner to make a diagnosis. There would be practically no mortality if the

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surgeon could see these cases first. I think it is the duty of every member of this Section who is doing surgery to teach the general practitioner to make an early diagnosis. If he is uncertain about an abdominal condition he should call a surgeon. The only mortality I have had in any of these cases has been in those in which the general practitioner had put off making the diagnosis or had neglected calling the surgeon. Another class of cases requiring prompt attention is that in which there has been pelvic inflammation with many adhesions. If we operate on these patients with a considerable amount of hemorrhage with adhesions and endeavor to clean up the pelvis at that time, there is danger. It has been my practice in certain cases simply to ligate the blood-vessels and leave the rest for a future time. Many of my cases have been diagnosed by the general practitioner as appendicitis, 90 per cent. of the extrauterine cases having been on the right side.

Dr. Henry Schwarz, St. Louis: I want to add my testimony that patients with ruptured tubal pregnancy will die at times if they are not interfered with. I have now in my possession a specimen from a case in which the woman died as she was seeking relief in the physician's office. She had not been examined and the rupture was not due to any handling by the physician. She dropped to the floor in the physician's office and was dead in a very few minutes. I have likewise seen within the last year a case in which the woman was evidently dying from internal hemorrhage, but the case was not diagnosed and the woman died while I was in the room. So women will die if the hemorrhage is allowed to go on, and I think there can be no difference of opinion that while the bleeding is going on we should operate at once if it is possible to get the patient to suitable surroundings. I likewise believe that it is wrong to give saline solutions or anything else to refill the system until the leak has been stopped. I sometimes defer operating on patients who have been allowed to go forty-eight hours or longer until they have recuperated. I feel that in these cases it may be wiser not to interfere. In many of these cases the rupture has been complete. The whole ovum has escaped and is found in the cul-de-sac of Douglas. After forty-eight hours the intestines have formed a roof over the hematocele and it does not seem good surgery to tear this open and clear out the hematocele which can be easily opened at a later season by vaginal incision and drainage.

Dr. Ralph Waldo, New York: There are two important points to be considered in a discussion of extrauterine pregnancy; perhaps more than two. In the first place, it is well to bear in mind that not far from 10 per cent. of all laparotomies performed in women are for extrauterine pregnancy in one form or another. In the second place, the most important point is to make a diagnosis. At the Lebanon Hspital in New York we admit patients with incomplete abortions with sep-

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sis. A large percentage of the extrauterine pregnancies which come into that hospital are brought in with the diagnosis of incomplete abortion with sepsis. Every one of those patients will have a little hemorrhage. Of course, the majority are abortions of the tube. The fetus dies or is gradually separated, as it would be in the uterus. A little bleeding occurs, but does not amount to much. The patient has a little colic and a sensation as though she were going to faint; becomes blanched. With an abortion there is a different type of pain. The patients do not faint. They become blanched until later in the condition when they have lost a large amount of blood. Several such attacks may occur. If the uterus has been curetted and the patient continues to bleed, ectopic pregnancy is usually present. They all have a little rise in temperature, to about 100 F. When there is sepsis the temperature is higher and there is usually a chill. Ideally, the time to operate in ectopic pregnancy is before it ruptures, but in a large percentage of cases the surgeon does not see the patient at this time. She is sent to him *in extremis*, in profound shock. In 1905, I published an article in which I claimed, and I still claim, that in that class of cases in which the patient is in an extreme condition, if she is kept perfectly quiet, the foot of the bed elevated, hypodermoclysis used, and hot salines given by the rectum, within a few hours reaction sets in; very seldom do patients so treated bleed to death. There is the type of case mentioned by the last speaker in which the whole top of the uterus is blown off, so to speak, and that patient usually dies before the surgeon gets to her. We have operated on something over 100 such patients and have lost but two. One it was thought would die when being transferred to the hospital. The other was operated on and everything seemed all right, when she died from pulmonary thrombus. A smaller percentage of patients will die if the operation is performed when the patient is not in profound shock; she may be bleeding and not in shock and operation can be done safely at once.

Dr. F. F. Simpson, Pittsburg, Pa.: It seems to me that there are two or three factors to be considered. In the first place, concerning the one who is to operate and the conditions under which operation shall be done. We would hardly advise a man who gets a new automobile to go into a Vanderbilt race the first day that he owns a machine. I think it hardly wise to advise a man who has never opened the abdomen to attempt to do so when the patient is in the most desperate condition imaginable. I can hardly conceive of less favorable circumstances for operation than with a patient miles out in the country without proper facilities, and the physician who has never opened the abdomen. I think we should distinguish between the man who has had extensive experience and the man who has never operated. I would not venture to suggest to the successful

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surgeon what he should do in a given case. I would, however, offer a protest against the teaching that immediate operation is absolutely necessary, basing that protest on a record of about 130 ectopic pregnancies, with but one death from hemorrhage. Of that number not more than two or three have been immediate operations; the mortality has been about 3 per cent. I believe that 2 or perhaps 3 per cent. of such patients will bleed to death under the best conditions if not immediately operated on. I believe that that number of deaths is smaller than will occur if the average person of varying fitness for such work opens the abdomen at once; then I would expect a mortality of approximately 10 or 15 per cent. A study from the literature of over 500 consecutive cases of ectopic pregnancy in which operation was done immediately, the cases being taken indiscriminately, showed a mortality of 19 per cent. Many of these patients were operated on by good men; many by those of limited experience. I believe that that mortality of 19 per cent. is not far from the mortality that will be obtained if the teaching is promulgated that immediate operation must be done. It seems to me that when a disease has a mortality of approximately 4 or 5 per cent., it is hardly wise to advocate an operation indiscriminately which will give a mortality of from 10 to 20 per cent.

Dr. H. G. Wetherill, Denver: I should like to speak of a practice which I have followed when difficulty has arisen, such as Dr. Waldo has referred to, in the differential diagnosis between ectopic pregnancy and an incomplete abortion. This differentiation is sometimes impossible in the early weeks of gestation. After exploring the uterus, I have snipped a small opening through the posterior vaginal fornix into Douglas pouch, solely for diagnostic purposes. It will then appear whether there is blood in the peritoneal cavity or not. If other pathologic conditions are found it may be possible to deal with them through this posterior vaginal incision. Dr. Simpson has expressed my views as to operation for ectopic pregnancy better than I could express them. The operation is one which may wait under many circumstances. The immediate mortality of the condition is not necessarily a high one, and I do not ordinarily favor operating on such patients when in profound collapse. With our present methods for combating hemorrhage, many of these women may be brought to a more favorable time for operation. It may be very unwise and inexpedient to do an emergency operation for ectopic pregnancy unless the conditions and the environment are favorable to the attainment of the best results.

Dr. George Erety Shoemaker, Philadelphia: The question whether a given group of patients should be immediately operated on depends on the observed facts, not on theory. The facts are that only a very small proportion of the patients with ectopic pregnancies that a surgeon sees are in a desper-

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ate condition at the time he sees them. Begin at once to get these few desperate patients under proper conditions; if possible to a good hospital; have the preparations for operation made while using subcutaneous or intravenous salt solution. In almost every instance by the time one is actually ready to operate the patient will not be *in extremis*, and it will be better to operate at once. Then, if we eliminate from that small number of desperate cases those patients in whom we can not make a very positive diagnosis, the group is further reduced, in which it is safe to wait. I have operated on many ectopic gestations, but few of the patients were in collapse when seen, and all who were operated on during collapse have recovered. None has been refused operation. No operation has been deferred because the patient was in bad condition. The question is: Will they bleed again if let alone? I have known of 4 cases, one of them my own, in which bleeding began while waiting. Hardly any case of extrauterine pregnancy has a history of just one pain, or just one hemorrhage. No one can tell whether there will be another attack as soon as there is reaction. It depends on a good many factors beyond our control, and I believe that competent men should operate at once. Do such patients die if let alone? One of Philadelphia's coroner's physicians kept a careful record in a series of recent years of all his post-mortem examinations. He tells me that of all women dying of actual bleeding, 20 per cent. had ruptured extrauterine pregnancy.

Dr. George M. Boyd, Philadelphia: I am in accord with the essayists and desire to emphasize what has been said by one or two in discussion, particularly the remarks of Dr. Polak, in regard to the history and the early diagnosis of this condition. When considering the subject of uterine cancer and the necessity of early diagnosis, stress was laid on history-taking, and I take it that here we should follow the same lines. It is essential to make the diagnosis early. Therefore, and this should be our teaching, every woman in early pregnancy suffering from pelvic symptoms should be looked on as possibly the victim of tubal or ectopic gestation. Let us, then, study our cases carefully. Our mistakes are often, I am afraid, due to a superficial study of the history of the case, depending too much on the pelvic lesion. Until I can satisfy myself that recurrent hemorrhage will not take place, I will continue to operate in those severe cases as soon as I can get the patients into proper condition for operation. That seems to me the better course to follow. It would be unfortunate if the impression were sent out from this Section that patients do not often die from this serious complication.

Dr. H. S. Crossen, St. Louis: There are two points which I wish to emphasize. In the first place, many patients operated on for tubal pregnancy are found to have not tubal pregnancy, but some entirely different disease presenting somewhat

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similar symptoms. This has happened so frequently, as indicated by the illustrative cases cited, that I feel we ought to study these uncertain cases more carefully. This is a borderline field in which work is needed. If we as teachers will give more attention to the conditions simulating tubal pregnancy, our students will do likewise, and a decided advance will be made in the differential diagnosis of these conditions. The second point I wish to emphasize is that certain cases of gonorrheal salpingitis so closely simulate tubal pregnancy that the differential diagnosis is extremely difficult, even when the attention is especially directed to this condition. In these most troublesome cases, valuable differential diagnostic points may be accumulated by close observation and accurate reporting of the cases by the profession generally.

Dr. L. G. Bowers, Dayton, Ohio: In a large percentage of cases I believe diagnosis is the easiest factor to deal with in ectopic gestation. In the cases that I have seen there have been more or less definite symptoms, either a missed period or a delayed period, though menstruation may have been reestablished; a little intermittent pain, probably a little increased temperature or perhaps subnormal temperature. If hemorrhage was recent, there may be passing of thready membrane, etc. Occasionally it is, of course, very hard to differentiate between this condition and acute salpingitis. Those cases, however, are rare. When we come to speak of operation we can definitely decide the best method of treatment to follow in two classes of cases: In those cases which are diagnosed before rupture, and those in which there has been a mild hemorrhage, operation should be done at once. The only cases in which delay is permissible are those in which the patients have had severe hemorrhage and are in extreme shock. We forget that most of these patients are not near expert surgeons; we forget how large the country is. Only a small percentage of those patients are taken to an expert, and when a certain method or procedure is advised, this fact must be considered. I do not know how many surgeons will operate in fourteen minutes; very few, I think. If all operated in that time the operation would be much less dangerous. Dr. McPherson did not tell us how many of his patients were bleeding nor how many were operated on after the primary shock was past; therefore, it cannot be estimated whether the operation saved life by stopping of the hemorrhage or his favorable results were secured when patients were operated on in extreme shock. I will venture to say that very few were operated on in profound shock. The patients in whom the pulse is fast and soft are those who die when operated on. If those patients are left alone for forty-eight hours they can be operated on safely. I do not believe that the patients on whom we do not operate until they revive from the shock

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should be stimulated much. It is better to lower the head of the bed and give them morphin.

When the abdomen is full of blood, the bleeding to some degree has been stopped by the intra-abdominal pressure produced by the blood. Also, this intra-abdominal pressure mitigates the shock to a great degree and the sudden relief of the pressure during the shock increases it, and for this reason we fill the abdominal cavity with salt solution before closing it and not only fill it, but by introducing the salt solution with a glass tube before the last stitches are drawn tight, thereby reestablishing the intra-abdominal pressure. The pulse is also reestablished, and by gradual absorption the physiologic effect of the salt solution is obtained.

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THE EARLY HISTORY OF ABDOMINAL SURGERY IN AMERICA

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The history of abdominal operations forms one of the most interesting chapters of surgery. It is not the purpose of this paper to write it in its entirety, since, treated in detail, it would fill a large volume. It is rather the desire to give a few pen-pictures, chiefly of a personal type, of the experiences of men whom I have known and to show, if I may, the earnest cooperation of a considerable group of America's most distinguished surgeons.

As it is still the custom in some parts of the south, speaking of events transpiring a generation ago, to group them chronologically as happening before or since the war, so we may wisely group the early data into the former period. America is justly credited with the initial step in this new departure of surgery and Ephraim McDowell of Kentucky is properly called the father of ovariotomy. Although this goes back to 1809, it teaches that the world then was not so very large, and the world of thought even smaller, since Dr. McDowell was a student in Edinburgh and carried with him to his then backwoods home the wise training which he received in what was, for a long time, the first center of European medical knowledge and education. In this later day, when specialism thrives in the great centers of population, we often look in vain among the specialists to find the splendid all-around educated men who can compare favorably with the judicial-minded,

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self-centered, better type of country practitioners. Such was Dr. McDowell, who necessarily had to do his own thinking; and it is the universal verdict that he did it wisely and well. Such also were the distinguished coterie of his followers, some of whom I had the honor to count as my friends, although they were in their full maturity while I was yet a junior. Thus I knew and loved the Atlees, splendid specimens of manhood of masterly intellect blended with a gracious sweetness and kindness as tender as that of a woman. Gilman Kimball of Lowell, Horatio R. Storer of Boston, and the immortal Marion Sims and Addison Emmet of New York were also among my early masters and life-long friends.

Washington L. Atlee was born in Lancaster, Pa., in 1808 and graduated from Jefferson Medical College in 1829. In an address to the alumni of that college Professor Gross described him when a student as tall, erect and handsome in person, neat in his appearance and possessed with an amount of industry, intelligence and ambition which foreshadowed his future success. Young as he was, he was constantly in search of new truths and devoted to his profession. In a pamphlet published by him entitled "Retrospect of the Struggles and Triumph of Ovariotomy in Philadelphia" he states:

On the 29th of June, 1843, my brother performed ovariotomy. This was the first time that both ovaries were removed. Being associated with him in the case, I commenced studying the literature of the operation and soon realized the bold and important step taken thirty-four years before by McDowell, of Kentucky.

Dr. Atlee operated twice in 1844. The first case, that of a woman of 61 years, proved fatal; the second patient recovered. His third operation, the first case in Philadelphia, was performed in March, 1849. He says, however:

On moving to Philadelphia I found I had roused up a hornet's nest. Ovariotomy was everywhere decried. It was denounced by the general profession, in the medical societies, in all the medical colleges and even by the majority of my own

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colleagues. I was misrepresented before the medical public and was pointed out as a dangerous man, even as a murderer. The opposition went so far that a celebrated professor, a popular teacher and a captivating writer, in his public lectures invoked the law to arrest me in the performance of this operation.

The name of Atlee stands without a rival in connection with uterine fibroids. His operations were so heroic that no one has yet dared to imitate him.

He died in September, 1878.

Dr. John L. Atlee shared the honors with his brother. In the discussion of the better methods of treating the pedicle of ovarian tumors (American Medical Association, June, 1876) he advocated the use of the clamp when possible, stating:

I have used the ligature; I have used the hot iron; I have used the needle through the pedicle and walls of the abdomen; I have employed every method of treating the pedicle except pocketing it, and I prefer the clamp. I think the advantage of the clamp consists chiefly in keeping dead tissues out of the abdominal cavity. It fixes the uterus in position. Owing to the relaxed abdominal wall it is not a drag on the pedicle. . . .

I have now operated over 340 times; over 200 times with the clamp with 79 per cent. recoveries. . . .

Dr. Sims objects to the clamp, since it may produce a sloughing of the pedicle and give rise to septicemia; this I have never seen. The pedicle recedes and the wound heals by granulation.

Dr. A. Dunlap of Ohio, a man whom, for his many excellent qualities, I learned to love, and a great admirer of Dr. McDowell, took exception to the use of the clamp, preferring small silk ligatures. He said:

The majority of the patients I have operated on would not have borne to have had the clamp applied putting the pedicle on stretch, since that would have endangered the patient on account of inflammatory action.

He states that he has had 80 per cent. of recoveries with which he has not been satisfied. He obscurely recognized infection and stated that some of his most favorable-looking cases were fatal, but not because of dis-

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turbance of the peritoneum. He used drainage-tubes in his most serious cases. He pointed out the increased mortality in patients operated on in large general hospitals and advocated careful exclusion in private wards. He gave the following reason for his objection to the drainage-tube:

The air will pass into the cavity of the peritoneum as readily as the fluid will pass out. Every motion of the diaphragm and abdominal muscles acts like a suction-pump and will draw air into the cavity of the peritoneum alternately with the outflow of the fluid. Blood and bloody serum which without the contact with air might have been safely absorbed, will be more likely to putrefy and thus increase the danger to the patient. In cases, however, in which it has already occurred, the insertion of a drainage-tube is useful in aiding the discharge of the pus and putrescent fluids.

Closely associated with ovariotomy is hysterectomy for the removal of large uterine myomata. Mr. Charles Clay of Manchester, England, is accredited with the first operation deliberately undertaken for this purpose. The patient died two hours afterward from hemorrhage. This was in August, 1843. In November of the same year Mr. Heath operated, the patient's death, attributed to shock, probably from hemorrhage, taking place seventeen hours afterward. The cause of death in both cases was considered to be the division of the pedicle by the knife rather than by écraseur. Mr. Clay's second case was in January, 1844. Death, caused by the nurse letting the patient fall on the floor, took place thirteen days after the operation. The first successful case was that of a patient of Dr. L. P. Burnham of Lowell, Mass., who was operated on in June, 1853. After describing the operation in detail, Dr. Burnham said:

I then passed a strong double ligature through the neck of the uterus and tied on each side; then, to make doubly sure against hemorrhage, a ligature was placed around the whole neck. No hemorrhage followed. After the removal of the uterus an examination of both ovaries revealed a diseased condition and they were accordingly extirpated. The abdominal cavity was then carefully sponged and all blood clots removed.

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The wound was treated with cold water dressings. Severe inflammation followed with free suppuration. The last ligature came away the fifth week. In all, Dr. Burnham performed fifteen hysterectomies for fibroid tumors with three recoveries. One death was due to hemorrhage. In the light of modern knowledge death in all the other cases was due probably to infection.

Dr. E. R. Peaslev of New York operated in 1853, death occurring on the eighth day from intestinal obstruction—the intestine protruding between the sutures.

More than passing notice is due one of my first teachers, Dr. Horatio R. Storer of Boston. Personally I am under a debt of gratitude to Dr. Storer which can never be paid. We loved him despite the enemies that he made. His equally distinguished father had carefully supervised his education. A graduate of Harvard, a student at law, in due course a doctor of medicine and for four years a sharer in the home and training of the immortal Simpson of Edinburg. As a labor of love for such instruction, he and the late Dr. Priestley of London edited the works of Dr. Simpson in two volumes. Dr. Storer returned to Boston and was appointed an instructor in the Harvard Medical School of the diseases of women. He had a most enthusiastic following when, as an undergraduate, I first met him. He soon became one of the most popular practitioners in the city of Boston and was said to have had the largest income of any member of the profession. He was indefatigable in his work. He founded the Gynecological Society of Boston, the first special society devoted to the diseases of women in the world; and for seven years he published the *Journal of the Gynecological Society of Boston*. The first successful case on record undertaken for the cure of umbilical hernia was one of his early operations. In September, 1865, he successfully performed hysterectomy; and this was the twenty-fourth case of the operation placed on record and the fourth successful case operated upon in America. In 1866 Dr.

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Storer contributed an elaborate paper on the treatment of the pedicle of fibroid tumors and strongly advocated the use of the clamp. He devised an instrument which he called his clamp-shield, an instrument capable of producing enormous compression and hinged on a pivot rotating so as to allow closure at any angle. I consider it the best, as well as last contribution for the external treatment of the pedicle by compression.

Dr. Storer made a further contribution, and in my judgment a more valuable one, which he called "pocketing the pedicle." Briefly, it was to suture the stump of the pedicle through and through with the deeper layer of the abdominal wall and thus keep under easy inspection the divided parts. By it he was enabled, in the non-infected cases, to close off the abdominal wall and protect the peritoneal cavity. This was, of course, a step in the direction of aseptic surgery, although taken blindly. There is no doubt that Dr. Storer was the "best-hated" member of the profession in Massachusetts. A long and dangerous illness removed him from the active arena and years were spent in Europe in quest of health, unfortunately never restored fully. He gave brilliant promise of being the leader of gynecology in America, notwithstanding the vituperative abuse unsparingly showered on him by men who should have known better. A generous share of this attention was bestowed on me as his aredent defender. I have somewhere a letter of his, written at the time, containing a touching appeal to forget him and his service to suffering humanity lest it work my ruin. He is a man of strong magnetic power, quick of thought and action, fluent of speech, equally ready to attack his enemies as to defend himself; and there are yet many who hold his service in grateful remembrance.

Dr. Gilman Kimball of Lowell, Mass., continued active until late in life. I saw him operate a number of times when past 70 with his usual skill and ability. I attended him in his last illness; he died when past 80

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of hemorrhage from the stomach. He was a man to command attention in any assembly, although modest in the extreme. His abdominal operations totaled about 300. He removed the uterus in fourteen cases with six recoveries.

One of the earliest hysterectomies under the antiseptic method which I find recorded was by Dr. T. G. Thomas of New York, who used his clamp and passed four knitting-needles at right angles through the pedicle to prevent slipping. Although Dr. Thomas called this the antiseptic method, in his report of the case, it may be questioned if infection did not follow, since he states that "the portion of the uterus in and below the clamp entirely sloughed out; the cavity which was left healing by granulations, so that no trace of the organ remained."

About this period Dr. Thomas invited me to New York to see him remove an abdominal tumor and pass judgment on his technic. The tumor proved to be a large multiple cystoma without adhesions and the operation, simple as it was, should have been a brilliant one. All the paraphernalia of the time was in requisition. Two large steam atomizers played constantly on the field of operation. The room was very hot and close. The small pedicle was ligated and dropped within the abdominal cavity. All went to the seeming approval of the select group of distinguished guests. Coming from the operation, Dr. Thomas asked my criticism of the operation, to which I replied asking if he sought compliment or the detection of faulty technic. He answered he hoped the latter. Then I called his attention to the fact that he had taken an unsterilized towel and wiped the perspiration from his face and hands during the operation. The patient died on the third day from infection; and Dr. Cleveland, his then assistant, told me that special preparations had been made in order to show me a faultless technic.

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Of the distinguished men who founded the Woman's Hospital of New York and who laid the foundation for abdominal surgery Sims, Emmet and Thomas stand out in bold relief. No men in America have had such splendid following. Sims was the magnetic, dashing Southern leader. Thomas and Emmet were his distinguished lieutenants, equally honored and beloved. The work of such masters is stamped with immortality.

Even the devastating war which, directly or indirectly, brought death, calamity and sorrow into every household of our great country had a fruitage of good. One of these benefits was the resultant better training of the younger generation of medical men in the field and camp. Many of the young army surgeons saw more clearly the need of higher education in their profession and were led to seek postgraduate training, then to be obtained almost exclusively in Europe. The surgical history of the Civil War was written by Dr. George A. Otis, formerly of Springfield, Mass., in a work perhaps unequaled by any American contributor to our literature. It is a mine of information which may be worked advantageously by any seeker of surgical knowledge; and I commend its careful study to those who would be masters of our art. I had the good fortune to begin my study of medicine with Dr. Otis as my preceptor and again to meet him when we were both surgeons in the Union army. He was a Virginian by birth. I sought his instruction on the recommendation of one of the first practitioners, who stated that Dr. Otis was probably the best educated physician in western Massachusetts. He had for a long time been a special student in Paris; for six years a medical editor in Richmond, Va., and later made Springfield, Mass., his home. He was a devout Catholic, fond of music and leader of the choir in his great church and an earnest union man. As a man of wealth he lived generously, his fine estate being nearly opposite the great Springfield arsenal. He appreciated the political situation far more accurately than most men of the north; and when, under the di-

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rection of Secretary Floyd, the arsenal was depleted of its hundred thousand modern rifles to stock the storehouses in the southern states, he pointed one day to the long line of teams with their precious freight and said to me, "You men of the North have little conception of the volcano over which you are living." He remained in the service of the United States until near his death, which occurred in Washington. I think he was never quite so happy as when preparing some interesting specimen; and our army museum is the monument of his skill and industry. His voice was soft and pleasing; his southern accent modified by his long Parisian training. He was small in stature, quick in action, and at once impressed himself on those about him as a leader. He collected the records of 3,717 cases of penetrating wounds of the abdomen during the war of the rebellion and gives the ratio of mortality at 87.2 per cent. In 2,559 cases in which visceral injury had taken place 92.9 per cent. died.

In the *Transactions of the American Medical Association* for 1881 my late and beloved friend, Dr. Hunter McGuire, another distinguished Virginian, discussed gun-shot wounds of the peritoneum. He pertinently inquires:

> Why are all penetrating wounds of the abdomen, with or without visceral injury, so fatal? Why, when the patient has escaped shock, exhaustion and hemorrhage should peritonitis kill within forty-eight hours? I believe the mortality is often due to some kind of blood poisoning connected with peritonitis just as often we see septicemia associated with peritonitis under other circumstances, notably after parturition and ovariotomy.

He said:

> The wound in the abdominal wall should be enlarged or the linea alba opened sufficiently so that the injured parts could be thoroughly examined. Hemorrhage should be arrested. If intestinal wounds exist, they should be closed with animal sutures, first trimming their edges if lacerated and ragged. Blood and all extraneous matter should be carefully removed and then provision made for drainage.

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He stated that these were the measures which he advocated in November, 1873, before the Virginia Medical Society. It must be recalled that at that date few accepted Mr. Lister's then novel views of infection, and it remained for Parks and Senn to enlarge on his teachings and engraft the new discovery on Dr. McGuire's urgent advocacy of peritoneal drainage. These three men were active co-workers until so recent a period that they are known to most of our present members. Perhaps less is known, however, of Dr. McGuire, who was a representative of the best type of Virginian. He was the medical director on the staff of General Stonewall Jackson and amputated his arm soon after the battle in which he was wounded. Four days later he died; his death being attributed to pneumonia due to the free use of cold water, but Dr. McGuire later told me that, interpreted in the light of modern knowledge, it was undoubtedly due to wound-infection.

Following the Civil War I was for some years an assistant at the Harvard Medical School and gladly sought the opportunity for further instruction by spending 1869 and 1870 in Europe, for the most part in Berlin. I was well trained in anatomy and I thought I knew surgery. Besides I spent a considerable portion of my time as a pupil of the immortal Virchow in the study of pathology. I first met Dr. J. Marion Sims in Paris only a little before the outbreak of the Franco-German war, in which he distinguished himself by inaugurating in the French army the American ambulance service as it had been developed during our Civil War. Ardent in his southern temperament, he determined that he would not live under the flag of our union. On this account he voluntarily expatriated himself and when abroad wrote his little volume on gynecology which almost at once gave him fame through Europe. Although not the first to operate for biliary obstruction, he was the first American to do the operation which was performed abroad, and, although he

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never repeated it, he elaborated and published the details of the technic much as used to-day.

In London I was the student of Paget, Ericson and Sir Spencer Wells with much profit. Mr. Paget asked me one day if I was familiar with the administration of ether, saying that he had heard much of its use in Boston, and, if so, he would like to have me etherize a patient for him. He stated that there had recently been six deaths from chloroform in the public service of London, and that he sought a safer anesthetic. I was introduced by him to the several hundred students occupying the amphitheater, while a small, nervous woman was brought in for operation. By good fortune the patient was soon asleep without a struggle, and Mr. Paget stated that, in so far as he knew, it was the first time that ether had been used as an anesthetic in London.

Only a very little later Sir James Simpson, who first used chloroform in surgery and stoutly declared that the only danger from its administration lay in the incompetency of the anesthetizer, had a patient die on the table before the operation was begun. Although a man of enormous physical vigor, he had greatly overtaxed himself and in his weakened condition the shock resulting from this death caused him to take to his bed and four days later he died from angina pectoris. The surgical profession of all Europe mourned his loss as that of a brother, and when, soon after, I visited his grave, the worn turf for a considerable space about his burial-place gave evidence of the crowds of both rich and poor who had thus sought to honor his memory.

Through the kindness of Dr. Storer it had been arranged that I should spend the summer under this great man. In the fulfilment of my plan I determined to remain in Edinburgh and thought to profit under another of Scotland's great teachers, Professor Syme. Sadly a few days later I attended his funeral. Chief among the mourners a medium-sized man, accompanied

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by a tall lady, was pointed out to me. It was Mr. Joseph Lister, who had married Professor Syme's daughter and through his influence had come to Edinburgh to be his successor in practice. My informant, a young local physician, said he was full of strange notions and that nobody in Edinburgh wanted him.

A few days later I presented my card and was received most cordially. I shall never forget the morning. His beds were on the first floor of the old infirmary, which was none too clean or attractive. He showed me a number of his patients; among others two or three with resections of the elbow-joint. The little patients were almost without pain or suffering, with only a moderate amount of serous discharge. Convinced by what I saw before the morning ended, I asked to be his special student for the summer; and day by day I learned more and more to admire and wonder at the miracles of modern surgery that I saw. I had heard much of Scotch character and had witnessed what I had deemed the extreme of ill temper exhibited by members of the profession in Boston, but that to which Lister was subjected exceeded all. Men well known in the world of science passed and repassed Mr. Lister in their rounds of daily duty without a nod of recognition, and this was by no means the limit of disapproval shown.

As Virchow in the former year had supervised the selection of my pathologic equipment, so Mr. Lister kindly aided me in obtaining a generous supply of his surgical material. The large rolls of his carbolic-lac-plaster puzzled our revenue officers in determining under what schedule they should be rated for duty. I was the first American pupil of the then almost unknown Mr. Lister, but in the enthusiasm of youth I thought it an easy matter to convert my brethren, forgetting for the moment that the master himself was the target of the most bitter criticism and that his methods were decried as unscientific and absurd. When I sought to make a

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practical demonstration in the hospitals of Boston I was frigidly told that when my services were desired I should be notified. Stung to the quick by the cool, bitter criticisms of many whom I had considered friends in the profession, refused a hearing on the subject before the medical societies, I, unwisely, as I now think, refused a professorship in Chicago and determined that Boston should yet recognize the value of the teachings of my master and honor me as his pupil. I opened a private hospital and, regardless of fee, welcomed whoever would come to me. Of course, little by little the results of my operative procedures became known. In a complacent way it was stated that I was lucky and later that I picked my cases. In 1876 I received a royal welcome in the American Medical Association when my beloved Dr. Sims was president..

I established a laboratory for bacteriologic and pathologic research, having the good fortune to secure the able assistance of the late Dr. A. P. Holt and Dr. Samuel Nelson of Cambridge, Mass. This work was continued fifteen years, the chief problem under consideration being the rôle of bacteria in their relation to surgery, then called surgical pathology. The tender sensibilities of women of doubtful age caused complaint of our work and the society of the long name became actively interested in our little colonies of rabbits and guinea-pigs kept in my large garden for experimental research. Thus from year to year, besides communications to many of the journals, I brought the fruitage of our work to the American Medical Association, until now each year since 1876 I have been in unbroken attendance and yearly have contributed the results of my studies. I am sorry to confess that the new teaching made slow progress in its acceptance, and not until after it had met German approval did the leading surgeons of Boston consider favorably its adoption.

I offer this brief chapter of personal history, since, in a way said to be peculiar to Boston, it is now claimed

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for one of its leading hospitals that antiseptic surgery was there first practiced and its methods introduced by its surgeons into America. Although such experiences are intensely bitter, they may be welcomed, since the better qualities and the higher attainment are the fruitage. At about this period Dr. Sternberg began his bacteriologic research work, and for years we were the pioneers in this field of knowledge so revolutionary in its practical teaching. We first knew each other through our publications. His wise superiors at Washington thought that this young medical officer was wasting his time in such foolish study and he was ordered to service upon an island in the Pacific. Replying to a letter of indignation on my part advising his resignation, he wrote, "Such experiences make the discipline of life. It is a long road that has no turn." The bestowal of the first honors that the government can confer on a medical officer shows that he was far wiser than I, although in a measure I tried to profit by his philosophic advice.

Little by little the unknown factors of the problem of infection and how to avoid it were slowly mastered, until now we look in wonderment on the revolutionary results of its teaching. Although general surgery has profited as never before, the battle royal of aseptic surgery was fought and won within the realm of the abdominal cavity. It would be almost invidious to single out from the considerable army of modern contributors the names of men still living and comparatively young to whom our great profession owe a debt of gratitude. A coming generation will do them ample honor. As the fruitage of my own work in research, there came almost by inference certain practical deductions.

Although in other publications I have shown that the buried animal suture is justly accredited to an early generation of American surgeons, its modern use and the reasons of its safe application are the triumph of Lister's genius, who knew nothing of this work so well

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done by Dr. Jamieson, whose experimental demonstrations were published in 1827. In the days of my pupilage with Mr. Lister, although he ligated arteries with seeming impunity, cutting short the catgut ligature and closing the wound aseptically, it had never occurred to him to bury sutures. He often called our attention to the interrupted stitch taken through and through, showing that active proliferation under aseptic conditions was not provocative of pus, but that the most active cell change took place in the deeper layer of the skin, where, if permitted to remain sufficiently long, the suture material separated, leaving the deeper portion to be absorbed. To me it seemed a simple corollary that the entire stitch could be buried and that like parts in well-vitalized tissues could be rejoined.

The first practical outcome of this reasoning was in 1870 in the cure of hernia, the cases being published in 1871. The keynote of the reasoning, the reconstruction of the parts to their normal anatomic condition, simple as it seemed, has proved the solution of the "thousand-year-old problem of surgery" and is in daily practice in all parts of the civilized world. It followed that every variety of hernia could be easily and simply cured. The causes of ventral hernia after operative interference were easily shown to be a maladjustment of the like structures of the abdominal wall, necessarily incident to the joining of the parts by the through-and-through interrupted stitch. This was easily obviated by the careful reunion of like structures by layers of continuous absorbable sutures. Such was the outcome that in the last 2,000 cases of laparatomy with primary union, in which the sundered structures were rejoined in layers with buried kangaroo tendon continuous sutures, I am not aware of a single case of hernia following operation.

The greater victories, however, have been won within the abdominal cavity. Very naturally the largest factor of success in the treatment of pathologic conditions

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here found result in an earlier recognition and surgical intervention. Ovarian and uterine tumors are rarely permitted to develop into the conditions in which they were commonly found by the earlier operators: a most important factor when comparing the statistical tables that is often overlooked. Tumors without adhesions leave the peritoneum as a rule uninjured. The intestines are disturbed only by displacement. Modern technic permits an easy inspection of the pelvic cavity and bleeding vessels are readily secured. The vexed question of the pedicle, so long a stumbling-block to our fathers, is easily solved. It early appeared to me to be very important to cover, in so far as possible, all excised and denuded surfaces with healthy peritoneum, first the pedicle of the ovarian growth; and in 1880 I first put in practice the infraperitoneal treatment of the cervical pedicle in the removal of myomatous growths.

"In 1880, assisted by my distinguished teacher, Dr. Gilman Kimball, of Lowell, I removed the uterus for the first time, for a large multiple myoma, where I adopted a modification of Schroeder's method, embodying all that is at present considered essential. Commencing on one side, I sutured the broad ligament with a double continuous tendon suture, extended so as to include the cervix. The broad ligaments were divided, the peritoneum reflected from either side, the stump cut down conically and covered over by an intrafolding of the peritoneum with a continuous sero-serous animal suture. The suture thus taken intrafolded the peritoneum evenly, while it was itself buried beneath it, leaving no line of infraction of the pelvic peritoneum. Thus the stump, while dropped within the abdomen, was itself extraperitoneal. This method seemed to me so important an improvement on that of Schroeder that I reported it in a paper read at the International Medical Congress[1] held in London in 1881. I incorporated it

1. Marcy, Henry O.: The Surgical Treatment of Uterine Myomata, Trans. Internat. Med. Cong., 1881, ii, 233.

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in further detail in my address on "Fibroid Tumors of the Uterus" as president of the Section on Obstetrics and Diseases of Women of the American Medical Association in 1882. In 1887 I reported still further my experiences with this method and emphasized its value. I also pointed out the importance of dealing with the larger number of uterine myoma which developed in such a way as to have really no pedicle. My last special contribution upon this subject was a paper entitled "The Surgical Treatment of Non-Pedunculated Tumors," read at the American Medical Association in May, 1890. Up to that period, in common with nearly every other abdominal surgeon, I had considered hemorrhage the greatest of all dangers; and in order to lessen this, I advocated and used the so-called rubber-dam, a thin sheet of rubber with a central reinforced opening which was stretched over the tumor and crowded down as far as possible to the base, around which was placed a constricting rubber ligature. The suggestion of its use occurred to me from noting the admirable service rendered the dentist by the constricting rubber placed around the root of a carious tooth. It served the double purpose of controlling hemorrhage and keeping the abdominal cavity entirely free from surgical contact. This was applicable, however, only to moveable tumors with a more or less distinct pedicle.

An aseptic operation thus carefully performed leaves a comparatively uninjured peritoneal cavity without points for subsequent adhesion, and convalescence speedily follows on the restoration of intestinal function.

The removal of the appendix, now a daily operation, is practically without danger when the operation is performed before the appendix ruptures and peritonitis sets in. In my entire series of several hundred cases I have not seen a patient seemingly approach the danger-line. It happens that I was the first operator in the world to remove the appendix in the so-called periods between the attacks. The credit of this interference was

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due to the insistence of the patient, a wise physician, who had concluded that this was the period of special safety. So important was the operation considered then that a number of leading surgeons came over from New York to witness it. This was in November, 1886.

The surgery of the biliary tract is so recent that it requires only reference. In 1880 Lawson Tait enthusiastically told me of his long series of operations, then numbering nearly forty. I have already referred to the case of Dr. Sims, and most know that Dr. Dobs of Indiana was the first surgeon in the world to operate successfully on the gall bladder. This was due, however, to accident rather than design, since the gall bladder was so distended with fluid that it was believed to be an ovarian cyst. I happen to be the first surgeon in America to operate successfully for biliary obstruction, the patient being a physician, aged about 70. This was in July, 1887. In October, 1889, I removed a gallstone from the common bile duct (the patient visited me only recently), and this proved to be the first patient operated on in the world for the removal of a stone lodged in the common duct. Now these operations, only so little ago declared by the leading authorities beyond the realm of surgery, are of such frequent occurrence that they cause little comment. Operation on the intestinal tract, on the bladder within the abdominal cavity, and even on the spleen and liver are by no means of rare occurrence.

The drainage of wounds, so long considered absolutely necessary, is the decided exception and should be almost never resorted to in aseptic conditions.

Thus closes a brief summary of the most brilliant achievements of modern surgery; and the contribution of the most important factors has been the work of American surgeons. There is good reason for believing that this is due in large degree to the openmindedness of her students. In the early part of this generation Germany claimed the rôle of honor in her teaching and

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would learn little from Great Britain and less from France. Great Britain, smarting under the loss of her recent prestige, refused to accept the teaching of either Germany or France; and France, in turn, which had claimed the banner for a century, would profit nothing from Germany or England. The American student without prejudice sought profit from all and earned the award so generously given by Virchow in his introductory address as President of the International Medical Congress in Berlin in 1890 when he said "America leads the world in surgery."

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TETANUS DEVELOPING TWELVE DAYS AFTER SHORTENING OF THE ROUND LIGAMENTS—RECOVERY

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In 1899 Dr. Joseph Taber Johnson reported before this section at the Newport meeting a case of tetanus following ovariotomy. The patient was operated on at his private hospital, and her death was the only one that had occurred in that institution for eighteen months. No other case of tetanus had been noted in any hospital or dispensary with which he had been connected; in fact, within his knowledge no case of tetanus had occurred throughout Washington for several years.

Twenty years have elapsed since that meeting. We have accomplished much through efforts to perfect our surgical technic. We know more about bacteriology, including the life history of the different pathogenic bacteria. The mortality and morbidity incidental to surgical work apparently has been reduced to a minimum. Even suppuration of an abdominal incision is a rare occurrence, necessitating an explanation as to causation in each individual case. Therefore, when last year tetanus developed in a patient operated on in my own institution, where the surgical technic is entirely under my control, not only was it startling, but it seemed of enough importance to warrant a thorough investigation and discussion. Let no man imagine himself so far superior to his fellow surgeons as to be exempt from complications such as this. Surely pride goeth before a fall. I am convinced now of the truth of the saying

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that if a man operate long enough and often enough he can illustrate in his own practice almost every surgical complication.

The case which serves as the basis of this paper is as follows:

REPORT OF CASE

The patient was single, aged 19, a student by occupation. She had suffered severely from dysmenorrhea since the establishment of her periods at the age of 13.

Operation.—The uterus was found to be somewhat enlarged and retroverted and to overcome the dysmenorrhea, curettage and shortening of the round ligaments were advised. These operations were performed at my private hospital, Nov. 17, 1908. As the uterus was freely movable, the abdomen was not opened, but the ligaments isolated and shortened within the inguinal canals through a single suprapubic incision. The shortened ligaments were held in place by catgut rendered sterile by a modified Claudius iodin method. The same material was employed for closing the inguinal canals and bringing the deeper portions of the incision together. Michel's clamps were used to coapt the edges of the skin incision.

For twelve days the patient had an uninterrupted convalescence. The stiches were removed on the tenth day and the wound found to have healed by primary union.

Postoperative Complication.—On the twelfth day the patient laughingly said that she thought she was going to have the mumps as her face was sore at the angles of the jaw and the latter seemed stiff. Parotitis, which at times follows gynecologic operations, was suspected. Examination showed no enlargement of the glands and there was no elevation of temperature. The soreness and stiffness of the jaws continued about the same for the next few days. The patient sat up on the fifteenth day for a short time. The jaws were sore and stiff, so that she ate solid food with difficulty. There was no rise of temperature or pulse, however, and the patient did not seem ill. For the next three days the patient's condition remained about the same with possibly a slightly increasing inability to open the jaws. The real nature of the disease was not suspected until the eighth day after the first complaints of stiffness about the jaws when the muscles of the back and the neck became rigid. There were sudden spasms of the muscles of the jaw, so that the patient frequently waked from a sound sleep from having bitten her tongue. As the day progressed the patient became quite excitable

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and for the first time the temperature was elevated, being 100 per rectum. Thoroughly alarmed at the condition of the patient and convinced that I had to deal with a case of postoperative tetanus, I sent for my friend, Dr. W. H. Hutchings of Detroit, as he had had considerable experience with the treatment of this disease by the use of chloretone. We saw the patient together about 11 p. m. December 6, the twentieth day after the operation and the eighth day since the development of the slight soreness and stiffness of the jaws. Examination at this time revealed marked trismus, the patient being able to open her jaws only enough to admit a feeding-tube. The muscles of the neck and back were rigid so that the patient could be lifted slightly from the bed by raising the head from the pillow. The abdominal muscles were rigid and somewhat painful on palpation. The patient had no difficulty in swallowing, although nourishment had to be taken through a tube. There were slight twitchings of the muscles of the face, although there was no risus sardonicus. Sudden movements about the bed, as for example the turning on of the electric light, caused contractions of the muscles of the neck and back, although opisthotonos was not present.

Treatment.—At 11:30 p. m. sixty grains of chloretone dissolved in hot olive-oil were administered per rectum. Within an hour the clonic contractions of the back muscles had ceased. The patient was much less rigid and could open her jaws decidedly more than before the administration of the antispasmodic. She expressed herself as very comfortable but very sleepy and thought she would have a good night. At 11:30 a. m. after the subcutaneous administration of 1,500 units of the antitetanic serum the patient slept until 5 o'clock when she was awakened by the spasmodic biting of the tongue. At 7 a. m. there was a return of the clonic contractions in the muscles of the back, the convulsive movements occurring from one to four minutes apart. At 9 a. m. the patient was again given sixty grains of chloretone by the rectum and at 10 o'clock another 1,500 units of antitetanic serum. After the second dose of chloretone there was no recurrence of the convulsive seizures. There was a gradual relaxation of the rigid muscles, although it was about a week before the jaws could be opened normally. Following the two large doses of chloretone the patient continued in a drowsy condition and slept a good portion of the time. Although there were no further muscular spasms, as an additional precaution, chloretone in thirty-grain doses was given daily for three successive days. Salines per rectum were given every

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two hours, beginning shortly after the administration of the first dose of chloretone. These injections were continued for eight days, although of necessity, because of the intolerance of the rectum, the intervals between the injections had to be gradually lengthened. However, a large amount of saline solution was absorbed during this period. The bowels were kept open, at least one free movement being secured daily.

Course of Disease.—After the second dose of the antitetanic serum, the wound was examined. It was found to have healed by primary union with the exception of a small point at the extreme right hand corner. Here was situated a minute blister, containing clear serum. Careful bacteriologic examination of this fluid failed to demonstrate the tetanus bacillus, the cultures showing staphylococci only. The patient left the hospital in excellent condition, thirty-two days after her operation and twenty days after the first appearance of the tetanus.

Now I propose to reverse the mental processes of the operator who is unfortunate enough to have a case of postoperative tetanus in his practice. After establishing the diagnosis his first thought is to save his patient; his second consideration is to ascertain the cause of the attack, so that he may guard against such an accident in the future. Hence the questions before us are:

I. What gives rise to postoperative tetanus?

II. What is the treatment of such a complication?

THE CAUSE OF POSTOPERATIVE TETANUS

By postoperative tetanus is meant the unexpected development of tetanus in an operative case, when there has been no history of traumatism, or conditions favoring the introduction of the tetanus bacillus. In other words, this definition includes cases which, barring the accidental introduction of the tetanus bacillus, would have ended in the complete recovery of the patient.

In the case just reported, the only change in the ordinary surgical technic of the hospital which up to this time had yielded gratifying results, was the use of a different kind of catgut. For years in my private work I have employed a catgut prepared by a firm which deservedly has acquired a good reputation from

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the quality of the gut it has placed on the market. Last year, however, it was thought advisable to have the catgut prepared in quantities by my laboratory assistant, a man well trained in pathology and bacteriology. I was loath to employ a new catgut, however, until the method and results of its sterilization had been approved by the highest authority. Therefore, before using the catgut in the hospital it was prepared and tested in Prof. F. G. Novy's bacteriologic laboratory in the University of Michigan. The mode of preparation was as follows:

A saturated solution of iodin crystals in chloroform was prepared by rubbing up in a mortar and allowing to stand for forty-eight hours. This solution was then filtered and the catgut immersed in it for eight days.

The catgut, thus prepared, was then tested as follows:

Test 1.—The coils of catgut were lifted from the containing jar with sterile forceps and from each of four coils there was excised with sterile scissors a piece from 2 to 5 cm. in length. These short pieces were allowed to stand twenty-four hours in sterile distilled water and then planted in deep bouillon tubes (20c.c. to the tube) and incubated at 37 C. for seven to fourteen days. This lot was unchanged at the end of this time save for one tube, which had been contaminated with some mould.

Test 2.—The above test was repeated with four other short pieces of catgut and after two weeks incubation only one tube was clouded. Stains and animal inoculations from this tube were negative.

From the results of these experiments I felt perfectly safe in using the catgut prepared acording to this method, perhaps more so since for some years I had been using at the University Hospital practically the same catgut with the best results.

Before the development of symptoms of tetanus in the case reported the catgut had been used in quite a number of cases with the most satisfactory results, all the wounds healing by primary union and the convalescence in each case being uninterrupted.

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I fear that many operators who report cases of tetanus following clean operations have fallen into the same error as did I in their attempts to absolve the catgut from any part in the causation of the disease. At first sight it seems reasonable to say it could not have been the catgut because the same material was employed in other cases with no bad results. Kuhn, however, has shown the fallacy of such an argument. He asserts that catgut is made from the intestines of sheep which exist under different conditions and vary much in health. Every catgut thread contains fibers from four or five different sheep. Just one of these fibers may contain the tetanus bacillus, while the others may be free from this particular germ. He goes on to say that the sanitary conditions in the slaughter-houses and factories from which the catgut comes are notoriously bad, exposing the raw material to all kinds of contamination. Experimentally it has been shown that it is most difficult for a sterilizing fluid to reach the interior of a catgut thread where many germs may lie. In order to insure absolute safety and do away with the possibility of postoperative tetanus, where catgut is to be used, the latter material must be taken from animals in perfect health. It must be prepared under the most hygienic conditions. Then the elementary threads should be tested for the tetanus bacillus and those found free of these organisms should be made into catgut which can be sterilized according to the most approved method.

Sterilization of catgut by boiling, while better than the use of chemical solutions, because of the possibility that the latter may not penetrate every portion of the catgut strand, has never been popular because of the difficulty of boiling the gut without destroying its integrity. It must be remembered, as pointed out by Theobald Smith, that under certain conditions, such as the formation of a pellicle or membrane over the surface of the boiled fluid, spores of anaërobic bacteria, such as the tetanus bacillus, resist repeated steamings

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for twenty minutes regularly, usually for forty minutes and occasionally for sixty minutes. Possibly the tests which have been employed to ascertain the asepticity of catgut, while applicable to the ordinary pathogenic bacteria, contain a source of error when used for anaërobic bacteria, like the tetanus bacillus. Are not we satisfied if the test-tubes without anaërobic conditions fail to show any growths? Implanted in the tissues, the tetanus spores, which have not been killed by the sterilization employed, develop under these anaërobic conditions and tetanic symptoms result.

Smith further on in the same article makes these statements, which are of special interest to the practical surgeon.

The great resistance of tetanus spores concerns both the practicing physician and surgeon and the laboratory worker who is engaged in the preparation of biologic products for subcutaneous administration. As regards the surgeon, I do not believe that the usual disinfection by boiling or steaming at 100 C. such as may be resorted to away from the hospitals need be placed under suspicion or discarded, but whatever has come in contact with fecal matter or with material undergoing putrefaction should be autoclaved at 110 C. to 115 C. unless the disinfective action of the boiling water in which objects are immersed is increased by alkalies and other substances.

In view of the extensive use of catgut in all kinds of surgical operations, it is of the utmost importance that the question of production of postoperative tetanus through its means be thoroughly investigated and discussed. While convinced that the postoperative course of my surgical cases is much smoother since the employment of the absorbable ligature, I would give it up at once were I convinced that my patients are liable to such a deadly infection as tetanus. One experience is enough to satisfy the most callous surgeon.

Recently Richardson has reported two cases of tetanus following operations for gallstones and for strangulated omental hernia. He has collected notes of 21 such cases

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in which tetanus followed a surgical operation, 20 occuring during the past three and a half years. In all these 21 cases catgut was employed, and in all except 2 the peritoneal cavity was opened. The operations were performed in Great Britain and 18 of the 21 patients died. The catgut used at the operations was examined bacteriologically in 14 cases, but these examinations were incomplete and Richardson thinks that it has not been proved that the catgut was the source of the infection. We are more interested in the number of cases Richardson has collected than in his rather fantastic suggestion that the disease from which the 18 patients died was not tetanus at all, but one of the sheep diseases, the patient being the host of the bacillus at the time of the operation. Richardson seems to base his entire argument on the geographical distribution of the cases and admits that if cases of postoperative tetanus developed in the south of England, where "looping-ill," the disease in question, does not exist, then his whole argument fails. While his argument does fail, for a search through the literature shows a wide distribution of the cases, shattering the geographical explanation of the infection beyond a shadow of a doubt, we should be under great obligation to Richardson for his collection of cases and his courage in showing this complication to be so common in Great Britain.

As an aid to the study of the various aspects of the question of postoperative tetanus, I have collected from the literature some 150 cases of tetanus following operations, in the main of a gynecologic nature. A few operations, like splenectomy, appendicitis, nephrotomy and hernia, operations which the gynecologist may be called on to do, no matter how strictly he may follow the lines of his specialty, have been included in the list. Excluding traumatic tetanus, many more cases could have been added, if general surgical operations had been included.

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TABLE 1.—101 CASES OF POSTOPERATIVE TETANUS UP TO AND INCLUDING THE YEAR 1890

A. Operations Involving the Opening of the Peritoneal Cavity

Operation.	No. Cases.	Recovery	Death.
Herniotomy	11	0	11
Hysterectomy for fibroid	1	0	1
Myomectomy	1	0	1
Oöphorectomy	2	0	2
Ovariotomy	63	5	58
Vaginal hysterectomy	1	0	1
Total	79	5	74

B. Operations in Which the Peritoneal Cavity was not Opened

Operation.	No. Cases.	Recovery	Death.
Excision of breast	11	2	9
Hydrocele	3	1	2
Operations on cervix	4	2	2
Perineorrhaphy for prolapse	1	0	1
Perineorrhaphy for complete tear	1	0	1
Prolapse of rectum	1	0	1
Uterine polyp	1	0	1
Total	22	5	17

Total number of operations 101.
Recoveries, 10; 9.9 per cent.
Deaths, 91; 90.09 per cent.

TABLE 2.—FORTY-NINE CASES OF POSTOPERATIVE TETANUS OCCURRING AFTER THE YEAR 1890

A. Operations Involving the Opening of the Peritoneal Cavity

Operation.	No. Cases.	Recovery	Death.
Alexander	2	1	1
Alexander and perineorrhaphy	2	1	1
Appendicitis	3	1	2
Colectomy	1	0	1
Herniotomy	4	1	3
Hysterectomy	10	1	9
Myomectomy	1	0	1
Ovariotomy	2	0	2
Removal of appendages	3	0	3
Removal of gall-stones	1	0	1
Splenectomy	1	0	1
Tuberculous peritonitis	1	1	0
Vaginal fixation	1	0	1
Vaginal fixation and trachelorrhaphy	1	0	1
Vaginal hysterectomy	4	0	4
Ventral hernia	1	0	1
Ventro-fixation	2	0	2
Total	40	6	34

B. Operations in Which the Peritoneal Cavity was not Opened

Operation.	No. Cases.	Recovery	Death.
Amputation of cervix and perineorrhaphy	1	1	0
Epithelioma of vulva	1	0	1
Hemorrhoids	2	0	2
Lumbar nephrotomy	1	0	1
Nephropexy	1	0	1
Removal of uterine polyp	1	0	1
Trachelorrhaphy and perineorrhaphy	1	0	1
Varicocele	1	0	1
Total	9	1	8

Total number of operations, 49.
Recoveries, 7; 14.28 per cent.
Deaths, 42; 85.71 per cent.

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TABLE 3.—CASES SINCE 1890 IN WHICH ATTEMPTS WERE MADE TO ISOLATE THE TETANUS BACILLUS AND RESULTS *

No. of Case.	Where Found.	Attempts Made.	Failure.	Success.	Recovery.	Day of Death.
20	Silver suture.	1	Yes	...	...	2
55	Pus from stump (1): Pus from stump where mouse was inoculated (2).	2	Yes	...	...	2
83	Pus from abdominal wound.	1	...	Yes	...	25
45	Wound.	1	...	Yes	...	2
48	Pus from abscess in paravaginal wound; secretion from wound with catgut sutures; cerebrospinal fluid; piece of skin from edge of wound.	1	Yes	...	...	16
59	Pus from abscess found in pelvis.	1	...	Yes(?)	...	2
67	Serum from below sutured skin of wound.	1	Yes	...	Yes	..
12	Not stated.	1	Yes	...	...	3
130	Not stated.	1	Yes	...	...	†
52	Not stated.	1	...	Yes	...	12
89	Not stated.	1	Yes	...	...	†
82	Not stated.	1	Yes	...	...	2
102	Secretion from seat of ulcer.	1	Yes	...	...	2
27	Area of subcutaneous tissue from scab on skin under left scapula.	1	...	Yes	...	3
28	Pus from wound (1): Kangaroo tendons (2); catgut (3).	3	Yes(3)	Yes(1,2)	...	3
87	Unused catgut.	1	Yes	...	...	2
80	Serum from blister in wound.	1	Yes	...	Yes	..
31	Blood from finger (1); Arachnoid fluid (2).	1	...	Yes	...	3
36	One stitch.	1	Yes	...	...	2
22	Blood suture materials and dressings.	1	Yes	...	...	20
23	Blood and vaginal discharges; suture material and dressings.	1	Yes	...	...	2

* The number in column "No. of Case" refers to the number of the case in the appended bibliography.

† Not stated.

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TABLE 4.—98 CASES OF POSTOPERATIVE TETANUS OCCURRING UP TO AND INCLUSIVE OF YEAR 1890

WITH SPECIAL REFERENCE TO THE ONSET AND ITS RELATION TO THE OUTCOME OF THE DISEASE

Day of onset after operation.	No. of Cases.	Recovery.	Deaths	Day of death. 1	2	3	4	5	6	7	8	10	11	13	20	
1	0	0	0	..	..	..	..	..	..	..	..	..	..	..	..	
2	0	0	0	..	..	..	..	..	..	..	..	..	..	..	..	
3	3	1	2	..	2	..	..	..	..	..	..	..	..	..	..	
4	4	0	4	..	3	..	..	..	..	..	..	..	..	..	..	Not stated, 1
5	6	1	5	2	3	..	..	..	..	..	..	..	..	..	..	
6	9	1	8	4	2	2	..	..	..	..	..	..	..	..	..	
7	18	0	18	3	10	5	..	..	..	..	..	..	..	..	..	
8	10	0	10	3	4	2	..	..	..	1	..	..	..	..	..	
9	9	0	9	..	1	5	3	..	..	..	..	..	..	..	..	
10	5	0	5	..	1	2	1	..	..	..	..	1	..	..	..	
11	3	0	3	..	1	1	..	..	..	1	..	..	..	..	..	
12	5	0	5	1	2	2	..	..	..	..	..	..	..	..	..	
13	6	1	5	..	..	1	..	1	..	..	1	..	..	1	..	Not stated, 1
14	5	1	4	..	..	..	1	..	..	1	..	1	..	..	..	Not stated, 1
10-15	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	
15	3	1	2	..	..	1	..	..	..	1	..	..	..	..	..	
16	2	1	1	..	..	..	..	..	..	..	1	..	..	..	..	
17	4	0	4	..	1	..	1	..	1	..	..	..	..	..	1	
20	1	0	1	..	..	..	..	1	..	..	..	..	..	..	..	
21	1	0	1	..	..	1	..	..	..	..	..	..	..	..	..	
22	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	
5th week	1	0	1	..	..	..	..	..	..	..	..	..	1	..	..	
	98	10	88													

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TABLE 5.—49 CASES OF POSTOPERATIVE TETANUS AFTER 1890

WITH SPECIAL REFERENCE TO THE ONSET AND ITS RELATION TO THE OUTCOME OF THE DISEASE

Day of onset after operation.	No. of Cases.	Recovery.	Deaths	Day of death. 1	2	3	4	5	7	8	12	16	20	25	
1	0	0	0	..	..	..	..	..	..	..	..	..	..	..	
2	0	0	0	..	..	..	..	..	..	..	..	..	..	..	
3	0	0	0	..	..	..	..	..	..	..	..	..	..	..	
4	2	0	2	1	..	1	..	..	..	..	..	..	..	..	
5	3	0	3	..	3	..	..	..	..	..	..	..	..	..	
6	7	0	7	..	4	1	1	..	..	..	..	..	..	..	Not stated, 1
7	5	0	5	..	3	1	1	..	..	..	..	..	..	..	
8	5	1	4	1	2	..	..	..	1	..	..	..	..	..	
9	11	0	11	2	3	2	1	1	..	..	1	..	..	..	Not stated, 1
10	6	2	4	..	3	..	..	..	..	..	..	..	..	1	
11	2	0	2	..	..	1	..	..	1	..	..	..	..	..	
12	3	2	1	..	..	..	..	..	..	..	..	1	..	..	
13	1	0	1	..	..	..	..	..	..	1	..	..	..	..	
14	1	0	1	1	..	..	..	..	..	..	..	..	..	..	
16	1	0	1	..	..	..	..	..	..	..	..	..	1	..	
19	1	1	..	..	..	..	..	..	..	..	..	..	..	..	
22	1	1	..	..	..	..	..	..	..	..	..	..	..	..	
	49	7	42												

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TABLE 6.—49 CASES OF POSTOPERATIVE TETANUS AFTER 1890

SHOWING EFFECTS OF ADMINISTRATION OF ANTITETANIC SERUM

Day of onset after operation.	No. of cases.	No. of cases having anti-tetanic serum.	Recovery.	Death.	No of cases not having serum.	Recovery.	Death
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	2	1	0	1	1	0	1
5	3	2	0	2	1	0	1
6	7	3	0	3	4	0	1
7	5	4	0	4	1	0	1
8	5	4	1	3	1	0	1
9	11	9	0	9	2	0	2
10	6	6	2	4	0	0	0
11	2	2	0	2	0	0	0
12	3	3	2	1	0	0	0
13	1	1	0	1	0	0	0
14	1	0	0	0	1	0	1
16	1	1	0	1	0	0	0
19	1	1	1	0	0	0	0
22	1	1	1	..	..	..	..
	49	38	7	31	11	0	11

TABLE 7.—TIME OF BEGINNING OF TREATMENT BY ANTITOXIN IN 34 CASES

SHOWING RECOVERIES AND DEATHS

Day of beginning antitoxin treatment after onset of tetanus.	No. of cases.	Recovery.	Death.
1	24	5	19
2	6	1	5
3	2	1	..
5	1	..	1
7	1	..	1

In 6 cases in which the patients recovered the tetanic symptoms appeared on the tenth day after the operation or later.

These 150 cases have been divided into two groups; the first, Table 1, numbering 101 cases which had occurred up to and inclusive of the year 1890; the second, Table 2, comprising 49 cases reported since 1890. Richardson's two cases were included in this last group, the other 19 cases reported by Richardson being unavailable for statistical purposes because of insufficient data. The lack of references in his article implies that the records of the 19 cases had been obtained through correspondence. If this be true, it would bring the total number of cases of postoperative tetanus since 1890 up to 70, it being remembered that these were largely abdominal

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and gynecologic cases, general surgical operations having been excluded.

The year 1890 has been chosen as the dividing line between the two groups, for the reasons that Phillips collected up to this date, through private correspondence and from the literature, 64 reports of cases of tetanus following ovariotomy, and because 1890 is a good date to separate the preantiseptic and antiseptic eras. For, while antisepsis had been proved to be correct in principle years before, it certainly was not generally adopted by surgeons until about this year. Furthermore, it was in 1889 that Kitasato first isolated the tetanus bacillus in pure culture and studied its biologic characters.

Before 1890, outside of the mere preparation of suture material, there were many more chances for the introduction of the tetanus bacillus into the wound than after that date, when more rational means were employed to sterilize extranous objects. Hence only the forty-nine cases collected since 1890 were studied with reference to the suture material. The information collected was very meager and unsatisfactory. The suture material employed was mentioned in only nineteen cases: Bissell (2); Chavannoz, Coe (2); Dorsett (2); Hammond, Jerie, Koch, Martin, Meyer, Penrose, Richardson (2); Shaw, Thompson, Zacharias (21). From these cases I find that there was used:

Catgut alone	3 cases
Catgut and kangaroo tendon	2 cases
Catgut, silk, silkworm gut or silver wire in combination	8 cases
Silk alone	4 cases
Silkworm gut alone	1 case
Silk with silver wire	1 case

In only two or three of these cases are definite statements made as to the preparation of the catgut, so we are at a loss to determine whether a possible source of error lay in such preparation. That the infection is not due to catgut in all cases is proved by postoperative tetanus in 6 cases in which silk or silkworm gut was

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either used alone or in combination with silver wire. A former Chairman of this Section, Dr. Dorsett, has given by far the most satisfactory report of his two cases of postoperative tetanus. His two patients died from this complication after the uterus had been sutured to the abdominal wall in each instance by kangaroo tendon sutures prepared by one of the best known manufacturing firms of this country. By inoculation into mice, the kangaroo tendon was proved to be infected with the tetanus bacillus.

Koch was able to prove that the catgut employed was the agent through which the infection arose. While he was unable to find the tetanus bacillus or its spores within the gut, mice inoculated with the gut died of tetanus. Chavannoz, Hammond, Coe, Richardson and Zacharias made either cultures of or inoculations with the suture material with negative results.

There were only two recoveries in the 19 cases just referred to (Meyer, Zacharias). This is of no special significance, since it is about the average of recoveries (10 per cent.) after this most fatal complication of surgical operations. The difficulties of adequate bacteriologic examination of suture material after the advent of the disease will always be great. Just as in my own case, the wound may have healed by primary union and the catgut either be absorbed or difficult to get at. The tetanus is not a rapidly multiplying organism and it is exceedingly difficult to isolate it after the infection has taken place. This applies to the bacilli and the spores in the catgut as well as to the same organisms in or about the wound.

Certainly Richardson's cases, in all of which catgut was employed as a ligature, are very suggestive as to the possibility, at least, of infection through this source. My own case, in which with the same technic a change in the method of preparing the catgut was almost immediately followed by a case of tetanus, is also very suggestive. While the case is not proved, enough evi-

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dence has been advanced to make the surgeon more careful than ever as to the asepticity of his absorbable ligature. Certainly it is much easier to render other objects sterile than it is catgut. While it is possible for the infection to be carried to the wound or into the patient's body through some other avenue, in some other way, one has to admit that it is not so probable. Air, dust, water, carious teeth, the patient's skin and other sources of infection have been invoked as carriers by the different authors, but their theories have added little to our exact knowledge of the question.

RELATION OF THE NATURE OF THE OPERATION TO POST-OPERATIVE TETANUS

A study of Tables 1 and 2 will show that the complication is more frequent after operations involving the opening of the peritoneal cavity. Up to 1890 there were 63 cases of ovariotomy followed by tetanus, with 58 deaths and 5 recoveries. Thus this accident followed ovariotomy in over one-half of the cases recorded for this period, while since 1890 only two cases of ovariotomy were followed by tetanus. There would seem to be only one explanation of this decrease, namely, improvement of technic whereby more tetanus bacilli were kept out of the abdominal cavity during the second period. One can not study the reported cases without becoming convinced that, considering the many thousand of abdominal operations, postoperative tetanus is a very rare complication. Modern abdominal surgery exacts such good results from the surgeon, however, that he finds but little consolation from the improvement of general statistics, if he be so unfortunate as to have a case of postoperative tetanus in his own practice. As will be seen by the tables, almost every gynecologic operation has been followed by tetanus. The complication more frequently followed operations involving the opening of the peritoneal cavity. But this is also true of any infection. The variety of abdominal operations followed by tetanus

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has naturally increased since 1890, on account of the development of new operations since that date. But the ratio between the cases of infection in the peritoneal and non-peritoneal operations is about the same before and after 1890. The natural inference is that since tetanus is a complication of nearly every kind of gynecologic operation the nature of the operation is not a determining factor in its production.

PERIOD OF INCUBATION OF POSTOPERATIVE TETANUS

Lambert, in speaking of tetanus in general, states that the prognosis is "in direct ratio to the shortness of the the incubation period and to the rapidity and intensity of the symptoms." In Table 4, 98 cases have been tabulated according to the onset of the symptoms, the outcome of the cases and the day of death in relation to the day of onset. No patient in this tabulated list received antitoxin, so it serves as a basis of comparison between the value of the two modes of treatment, when antitoxin is administered after the onset of symptoms. Table 4 shows that in 64 out of 98 cases, or in practically two-thirds, the initial symptoms were within the first ten days. In the remaining 34 cases, the onset of the disease varied from the eleventh to the twenty-second day. There was one anomalous case in which there was a five weeks' incubation period, but such cases are unusual and always open to suspicion.

In Table 5, or in the 49 cases after 1890, there were 39 in which the first symptoms appeared within the ten-day period, or practically four-fifths of the cases, figures corresponding to Joseph Jones' statistics as given by Osler. In the remaining ten cases the initial symptoms are recorded as appearing from the eleventh to the twenty-second day.

RELATION OF ONSET OF SYMPTOMS TO DAY OF DEATH

This is irrespective of the treatment administered, although again it must not be forgotten that no antitoxin was administered prior to 1890. Looking at the

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cases starting within the first ten days, as tabulated in Table 4, we see that up to the ninth day in 50 out of the 98 cases, the patients died on or before the third day. After the tenth day there was not one patient out of the 48 who died on the first day of the disease, the deaths being scattered from the second to the twentieth day. Practically about the same showing is made in the cases occurring after 1890, Table 5. Up to the tenth day the patients died quickly, only a few living beyond the fourth day of the disease. Those with a longer incubation period lived the longest, one even living to the twenty-fifth day. Thus these tables would seem to bear out the claims of various writers, that the shorter the incubation period the more virulent and active is the disease, and, conversely, the longer the period of incubation the milder the disease, or the longer can the patient survive before a fatal issue.

Not a single case of tetanus developed during the first two days after the operation, and in Table 2 no case appeared until the fourth day. In the 98 cases occurring before the year 1890 the maximum number of cases (18) is recorded as developing on the seventh day, while in the 49 later cases the greatest number (11) developed on the ninth day.

TREATMENT

The treatment of tetanus may be summarized briefly as follows:

1. By proper disinfection and drainage at the point of entrance of the tetanus bacilli, we should prevent, as far as possible, further development of bacteria and the absorption of the elaborated toxins.

2. The toxins in the blood which have not united with the nerve cells should be neutralized and rendered inert by the administration of antitetanic serum.

3. The muscular spasms should be controlled by some antispasmodic.

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4. Elimination of the poison already absorbed is best obtained by free catharsis and the administration of large quantities of physiologic salt solution.

1. Disinfection and Drainage.—As has been pointed out, this is much more difficult as a rule in postoperative than in traumatic tetanus. The tetanus bacilli may have been implanted on the peritoneum, or may be in the ligature with which a pedicle was tied. There may be no evidence, as far as the wound is concerned, that tetanus bacilli or their spores are present. In many instances it would be obviously jumping in the dark to open up the wound and drain. Yet when the latter suppurates or the proper indications exist, disinfection and drainage should be employed in postoperative as well as traumatic tetanus.

For example, in the case reported, it would have been foolish to reopen the wound, which practically had healed by primary union, when it was not at all certain where the infection had entered. If the wound had suppurated, however, the indications would have been for its early opening, disinfection and drainage.

2. Administration of Antitetanic Serum.—It seems to be pretty well established that after the toxins have become fixed in the nerve cells, the administration of antitetanic serum has but little influence on the course of the disease. The injury has already been accomplished and the most that the serum can do is to prevent further combination with the nerve cells. For this purpose and because its proper administration is harmless, it should be given in every case, immediately on the onset of symptoms. Inasmuch as postoperative tetanus is never anticipated, the prophylactic use of the serum has no place in the class of cases under discussion. A comparison of Table 1, in which 101 patients were treated without the antitetanic serum, with Table 6, in which 38 patients out of the 49 were treated with the serum, shows a diminution of the mortality under the use of the serum from 90.09 per cent. to 81.58 per cent. This is not much of a

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showing; still it is a decided gain. In the 11 cases in which no serum was employed, there was not a single recovery. The good results of the serum may have been due partly to the fact (Table 7) that in 24 of the 38 cases, its administration was begun on the first day of the appearance of the symptoms. On the other hand, in 6 cases in which the administration was begun on the second day there was only one recovery.

It must not be forgotten, however, that whenever we consider the efficacy of any particular form of treatment we must also consider the severity of the symptoms in the cases under treatment. Thus, the good results may not have been so much due to the antitoxin as to the fact that the cases were of a mild type and the patient might have recovered under any form of treatment. Hence the significance of the note at the bottom of Table 7, which states that in six of the seven patients recovering, the tetanic symptoms appeared on the tenth day after the operation or later.

3. Control of Muscular Rigidity and Spasms by the Use of Antispasmodics.—The list of drugs used for this purpose is large and has not been particularly satisfactory. Opium, chloral hydrate, the bromids, calabar bean, chloroform, etc., have each been tried with varying success. The objections to the use of many of these drugs are that, while they partially control the spasms, they prevent elimination and deprive us of a most necessary form of treatment.

The subarachnoid injections of magnesium sulphate, as first suggested by Meltzer, undoubtedly control the spasms, but respiration is so inhibited at the same time as to make it questionable whether the treatment may not prove worse than the disease.

As regards the use of chloretone, I can only say that it has proved most efficacious in the hands of Dr. Hutchings, who has absolutely controlled the spasms in six cases, while as far as could be judged no bad symptoms developed from the use of the drug. Certainly the effect

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of chloretone in the case reported above was most satisfactory. The muscular spasms were absolutely controlled after two sixty--grain doses and the muscular rigidity practically abolished. At least, since the drug is harmless, chloretone is worthy of an extensive trial in the treatment of tetanus and other spasmodic conditions.

4. Elimination Through Free Catharsis and the Use of Salt Solution.—The elimination of the poisons in the body is especially demanded in a disease like tetanus. The tissues may interfere with the administration of cathartics, but in that case they may be introduced through the stomach-tube, after the relaxation has been accomplished through chloretone. Fortunately salt solution can always be administered, either intravenously, subcutaneously or per rectum, the method being determined by the condition of the patient.

CONCLUSIONS

1. While tetanus can not be said to be a very frequent postoperative complication, a study of the reported cases shows it does occasionally follow all kinds of gynecologic operations.

2. It most frequently is a complication of operations involving the opening of the peritoneal cavity, although in quite a percentage of cases it complicates plastic and other non-peritoneal operations.

3. The infection in all probability is introduced at the time of operation.

4. It has been proved that the tetanus bacillus and its spores are most difficult to kill, and that under certain circumstances they survive boiling for sixty minutes; hence when this organism is present more than ordinary heat, applied over a longer time, is necessary.

5. Absorbable ligatures, like catgut, may be carriers of the infection, unless the most approved methods of sterilization be employed.

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6. The process of manufacture of the catgut renders it peculiarly liable to infection by the tetanus bacillus, which may not be destroyed by the ordinary methods of chemical sterilization.

7. The initial symptoms of postoperative tetanus appear within ten days in from two-thirds to four-fifths of the cases. The onset of symptoms in the remaining cases varies from the eleventh to the twenty-second day after the operation.

8. In the 150 cases tabulated no case showed symptoms of tetanus the first two days after the operations.

9. From a study of these cases it would seem that the average period of incubation for postoperative tetanus was about eight days.

10. The shorter the incubation period the more virulent and active the disease, and, conversely, the longer the incubation the milder the disease or the longer is it possible for the patient to survive before a fatal issue.

11. Whenever possible the point of entrance of the tetanus bacilli should be ascertained and the proper disinfection and drainage be instituted. This is often difficult in cases of postoperative tetanus.

12. Antitetanic serum acts on the free toxins in the blood, but has no effect on the toxins after they have become fixed in the nerve cells.

13. A study of the tables shows that the mortality of tetanus has been reduced nearly 10 per cent. through the use of the antitetanic serum.

14. The best effects of the serum will be seen when its administration is begun on the first appearance of the symptoms of the disease.

15. Chloretone is able to control the muscular spasms of tetanus and to do away with the muscular rigidity. It is harmless and does not prevent elimination.

16. In tetanus, elimination through free catharsis and the administration of salt solution is of the utmost importance.

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BIBLIOGRAPHY OF CASES

Case.
1. Aspell: Monatschr. f. Geburtsh. u. Gynäk, 1901, xiii, 401.
2. Bach: Gaz. méd. de Strasbourg, 1852, p. 424; Deutsch. Chir., 1886, lviii, 372.
3. Bantock, J. G.: Tr. Path. Soc. London, 1880, xxxi, 7; Med.-Chir. Tr., 1892, lxxv, 154.
4. Baum: Deutsch. Chir., 1886, lviii, 373.
5. Bennett, J. M.: Lancet, London, 1881, ii, 947.
6, 7. Bissell, J. B.: (Two Cases), Philadelphia Med. Jour., 1901, vii, 352-355.
8. Börner: Med.-Chir. Tr., 1892, lxxv, 156.
9. Boinet: Maladies des ovaries, 1877, Ed. 2, table, p. 577; Med.-Chir. Tr., 1892, lxxv, 160.
10. Booth, C. C.: The Journal A. M. A., 1905, xlv, 42.
11. Breisky: Deutsch. Chir., 1886, lviii, 371.
12. Brewer: Ann. Surg., 1906, xlvi, 346.
13. Brown, B.: Surgical Diseases of Females, 1856, p. 253 (case 58); Ed. 2, 1861, p. 389 (Case 5).
14. Bueno: Crón. méd.-quir. de la Habana, 1887, xiii, 168; Med. contemp., Lisbon, 1887, v, 179.
15. Buffet: Normandie méd., Rouen, 1888, iv, 357.
16. Callisen, H.: Acta reg. Soc. med. Havn., 1791, ii, 1.
17. Cazkovic, M. V.: München. med. Wchnschr., 1897, xliv, 781; Centralbl. f. Chir., 1897, xxiv, 728.
18. Chadwick, J. R.: Boston Med. and Surg Jour., 1875, xciii, 522.
19. Champneys, F. H.: Hosp. Reg. P. M., No. 382; Med. Chir. Tr., 1892, lxxv, 156.
20. Chavannoz: Wien. klin. Wchnschr., 1902, xv, 272; Soc. d'obst., gyn. et pédiat. de Bordeaux, 1902.
21. Clot-Bey: Schmidt's Jahrb., 1835, 1, v, 222.
22, 23. Cole, H. C.: (2 Cases), Am. Gynæc. and Obst. Jour., 1901, xix, 500.
24. Consentino: Ann. di ostet., 1885, p. 389; Med.-Chir. Tr. 1892, lxxv, 156.
25. Dawson: Am. Jour. Obst., 1876, ix, 85.
26. Donand: Bordeaux méd., 1873, ii, 147.
27, 28. Dorsett, W. B.: (Two Cases), Am. Jour. Obst., 1902, xlvi, 620.
29. Fayrer, J.: Ann. Med. Sc., Calcutta, 1870-1, xiv, 237-239.
30. Ferguson: Lancet, London, 1860, ii, 162.
31. Ferrari: Semaine méd., April 13, 1887; Rev. de chir., Paris, 1887, vii, 590; Lancet, London, 1888, i, 212.
32. Ganiez: Bull. Soc. de chir. de Paris, 1878, iii, No. 8; Centralbl. f. Chir., 1878, v, 797.
33. Gay, G. W.: Boston Med. and Surg. Jour., 1876, xcv, 241-243.
34. Gregory, E. H.: Tr. Am. Gyn. Soc., 1877, ii, 317; Deutsch. Chir., 1886, lviii, 373.
35. Gueniot: Gaz. d. hôp., 1877, l. 741.
36. Hammond, L. J.: Am. Med., 1903, v, 963; Am. Gyn., New York, 1903, ii, 368.
37. Hare, A. W.: Brit. Med. Jour., 1884, ii, 652.
38. Heineke: Schmidt's Jahrb., 1866, cxxx, 298.
39. Helmuth, T.: Homeop. Jour. Obst., 1884-5, vi, 14.
40. Hennig, C.: Med.-Chir. Tr., 1892, lxxv, 135.
41. Hochhalt and Herczel: Semaine méd., 1902, xxii, 86.
42. Horrocks, P.: Med.-Chir. Tr., 1892, lxxv, 135.
43. Howitz: Jahresb. ü. d. Leistung. in d. ges. Med. (Virchow and Hirsch), 1875, ii, 570.
44. Humphrey, G. M.: Tr. Am. Gyn. Soc., 1877, ii, 317-323.
45-48. Jerie, J.: (Four Cases), Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1908, xix, 282.
49. Johnson, J. T.: Ann. Gyn. and Pediat., 1888-9, ii, 543.
50, 51. Kaltenbach, R.: (Two Cases), Tr. Am. Gyn. Soc., 1877, ii, 317.

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52. Kammerer, F.: Ann. Surg., 1906, xliv, 352.
53, 54. Kimball, G.: (Two Cases), Tr. Am. Gyn. Soc., 1877, ii, 317; Boston Med. and Surg. Jour., 1874, xc, 517 (Case 3).
55. Koch, E.: München. med. Wchnschr., 1898, xlv, 1036; Deutsch. Ztschr. f. Chir., 1898, xlviii, 417.
56. Kötschan, J.: München. med. Wchnschr., 1887, xxxiv, 855.
57. Kopf: Allg. Wien. med. Ztg., 1858, iii, 154.
58. Langenbeck: Deutsch. Klin., 1852, iv, 8, 21.
59. Leopold: Centralbl. f. Gynäk., 1903, xxvii, 555.
60. Macartney, D.: Lancet, London, 1896, i, 157.
61. Malins, E.: Brit. Med. Jour., 1881, i, 509.
62. Martin, E.: Centralbl. f. Gynäk., 1906, xxx, 395.
63., 64 Meinert: (Two Cases), Arch. f. Gynäk., 1893, xliv, 381.
65. Menzer: München. med. Wchnschr., 1900, xlvii (2), 1756.
66. Mensel: Deutsch. Chir., 1886, lviii, 370.
67. Meyer, W.: Ann. Surg., 1905, xlii, 458.
68. Mikschik, F.: Schmidt's Jahrb., 1854, 11, lxxxiv, 298.
69. Mudd, H. G.: Ann. Surg., 1906, xliv, 358.
70. Müller, P.: Med.-Chir. Tr., 1892, lxxv, 135.
71. Nélaton: Med.-Chir. Tr., 1892, lxxv, 135.
72. Nott, J. C.: Med. Gaz., New York, 1867-8, i, 367.
73, 74. Olshausen, R.: (Two Cases), Med.-Chir. Tr., 1892, lxxv, 154.
75. Palfrey: Obst. Jour., Gr. Brit., 1880, viii, 672.
76. Paolini, M.: Schmidt's Jahrb., 1836, Suppl. 1, p. 253.
77. Parker, R.: Lancet, London, 1901, i, 709.
78. Parvin, T.: Tr. Am. Gynec. Soc., 1877, ii, 317-323.
79. Penrose, C. B.: Ann. Surg., 1898, xxvii, 231.
80. Peterson, R.: Am. Jour. Obst., April, 1909, lix, 658.
81. Phillips, J.: Med.-Chir. Tr., 1892, lxxv, 135.
82. Porter: Am. Jour. Surg., July, 1876; Ann. Surg., 1906, xliv, 360.
83. Rambaud: New York Med. Jour., 1898, lxviii, 884.
84-86. Reynier, P.: (Three Cases), Bull. et. mém. Soc. de chir. de Paris, 1902, xxvi, 647; Rev. de chir., 1901, xxiv, 104; Arch. f. klin. Chir., 1904-5, lxxv, 141.
87, 88. Richardson, W. G.: (Two Cases), Brit. Med. Jour., April 17, 1909, p. 948.
89. Roe, W. J.: Ann. Surg., 1906, xliv, 355.
90-93. Rose, E.: (Four Cases), Deutsch. Chir., 1897, viii, 275, 276, 277.
94. Salmon: Med.-Chir. Tr., 1892, lxxv, 154; Maunowry. in Thiriar's paper, p. 102 (Case 40).
95. Sarrel: Deutsch. Chir., 1886, lviii, 372.
96-100. Savage, T.: (Five Cases), Med.-Chir. Tr., 1892, lxxv, 154.
101. Schatz: Med.-Chir. Tr., 1892, lxxv, 156.
102. Shaw, C. K.: Month. Homeop. Rev., London, 1899, xliii, 149.
103. Shultenaf, M. W.: Finska läk-sallsk. handl., 1881, xxiii, 386-389.
104. Simpson, J. Y.: Selected Obstetrical and Gynecological Works, 1871, p. 570.
105. Slawjanski, K.: Med.-Chir. Tr., 1892, lxxv, 152.
106-114. Stilling: (Nine Cases), Deutsch. Klin., 1867, xix, 97, 112, 144 (Case 11); ibid., 1866, xviii, 38, 46, 58, 73 (Case 10); ibid., 1867, xix, 204, 213, 227 (Case 12); ibid., 1868, xx, 181 (Case 16); ibid., 1872, xxiv, 396 (Case 25); ibid., pp. 418, 428, 437 (Case 27); ibid., 1869, xxi, 241; Tr. Am. Gynec. Soc., 1877, ii, 317.
115-118. Thiriar: (Four Cases), Gaz. d. hôp., 1886, lix, 123; Compt. rend. du Cong. franç. de Chir., Paris, Session 2, 1886, p. 97 (Obs. i. Case 40); p. 98 (Obs, ii, iii, iv); Med.-Chir. Tr., 1892, lxxv, 156.
119. Thomas: Tr. Am. Gynec. Soc., 1877, ii, 317; Am. Jour. Obst., 1879, xii, 600.
120. Thompson, H.: Lancet, London, 1900, i, 157.

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121. Thompson, F. D.: Tr. South. Surg. and Gynæc. Assn. 1897, Philadelphia, 1898, x, 148.
122. Tilanus: Deutsch. Chir., 1886, lviii, 371.
123. Tizzoni, G., and Parona, F.: Ann. univ. di med. e chir., 1877, ccxxxix, 193; Centralbl. f. Chir., 1877, iv, 461.
124. Torneau: Deutsch. med. Wchnschr., 1904, xxx, 347.
125, 126. Ulbrich, C.: (Two Cases), Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1902, x, 120 (Cases on pp. 131 and 132).
127, 128. Underhill, T.: (Two Cases), Brit. Med. Jour., 1881, i, 807.
129. Verneuil: Bull. de l'Acad. de méd., 1893, xxix, Series 3, 628 (Case 4, p. 632).
130. Warbasse: Ann. Surg., 1906, xliv, 346.
131. Wanthy: Jour. de méd., Brussels, December, 1875, p. 522.
132. Weir, W.: Glasgow Med. Jour., 1830, iii, 430.
133-137. Wells: (Five Cases), Med. Times and Gaz., 1859, ii, 589; Lancet, London, 1859, ii, 618; Diseases of the Ovaries, London, 1865, p. 35; Med.-Chir. Tr., 1892, lxxv, 150.
138. Werth: Register Keil Jour., 9598, p. 49; Med.-Chir. Tr., 1892, lxxv, 154.
139-143. Wilms: (Five Cases), Deutsch. Chir., 1897, viii, 271.
144. Winterbotham: Brit. M. J., 1867, i, 690.
145. Wood, H. C.: Univ. M. Mag., Philadelphia, 1897-9, x. 608.
146. Yahoub: Gaz. méd. d'Orient, Constantinople, 1906-7, li, 201.
147-148. Zacharias, P.: (Two Cases), München. med. Wchnschr., 1908, lv, 227.
149-150. Zweifel: (Two Cases), Berl. klin. Wchnschr., 1881, xxviii, 305; Med.-Chir. Tr., 1892, lxxv, 152.

OTHER REFERENCES

Kitasato: Ueber den Tetanuserreger, Ztschr. f. Hyg., 1889, vii, 225; Deutsch. med. Wchnschr., 1889, xv, 635.
Kuhn, F.: Die postoperativen Fälle von Tetanus von Zacharias, Fälle von Katguttetanus. Bemerkungen zur Arbeit von Zacharias. München. med. Wchnschr., 1908, lv, 628.
Osler, W.: Practice of Medicine, 1903, Ed. 5, p. 231.
Smith, T.: Some Neglected Facts in the Biology of the Tetanus Bacillus, Tr. Chicago Path. Soc., March 1, 1908, vii, 1.

ABSTRACT OF DISCUSSION

Dr. W. B. Dorsett, St. Louis: In the consideration of this subject, whether it is kangaroo tendon or catgut, we ought to consider the size of the material used; for any size above No. 3 is liable to have in the center of the strand the infectious material. In other words, the manufacturer of this gut will admit that it is harder to sterilize a large strand than a small strand. Experiments have been made in which the gut has been suspended in anilin dye and sections taken showed that the anilin dye does not always penetrate to the center. The unfortunate cases that I have had prove rather conclusively that the infection did not occur from the catgut that was used, but from the kangaroo tendon. This was of a large size and the postmortem showed that it contained the tetanus bacillus and the spores. At that time I had quite a supply of suture material that I had obtained from the manufacturers. Immediately after a second case occurred I telegraphed them to call in all the gut that they had sent out and that the kangaroo was probably infected. I got no response until the agent came to St. Louis for the purpose of disposing of his

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material and he then found that it was not wanted in the instrument houses. Chloretone is new to me. The antitetanic serum in my opinion should be used as a prophylactic rather than as a remedy after the disease has once shown itself. So much impressed have been some of my friends who do general surgery with the use of antitetanic serum, that as soon as a punctured wound is discovered in persons working about stables or coming in close contact with street dirt, the serum is used as a prophylactic before anything else is done. In my two cases it had no effect as it was not used in time, and the chloroform was used simply to control the spasms.

Dr. Ralph Waldo, New York: I have seen four of these cases. Three followed abdominal operations. The material used as suture and ligature was catgut of rather large size for the adnexa which were removed. In one case a large ovarian tumor was removed. The more superficial portions of the wound were closed with silkworm gut. Whether the infection was due to the fact that the catgut was of rather large size I am unable to say. In two of these cases I performed several operations in the same operating-room at the same hour with the same assistants and using the same material. From the tenth to the twelfth day the first slight symptom appeared in the neck. No notice was taken of it until about the thirteenth or fourteenth day. The most exhaustive bacteriologic examinations were made of the catgut and everything else possible with a negative result. I speak now of three of the cases. I went very carefully into the serum question and became thoroughly convinced that if the serum was given after the disease had developed it was useless in a very large percentage of cases. My laboratory friends had used it in guinea-pigs and found that if it were used as a prophylactic the disease was prevented. If it were used after the symptoms developed, as much serum were required as the guinea-pig weighed in order to counteract the toxin. For this reason its use was impracticable. In another case a patient with uterine hemorrhage was given a hypodermic of ergot supposed to be sterile. She was brought to the hospital in the ambulance and later developed tetanus. We found a little bleb where the hypodermic had been given. This was opened and found to be full of the germs of tetanus, proving that the disease was caused by the hypodermic, whether the germ was on the skin or on the needle no one knows. In three other cases we were absolutely unable to determine anything concerning the entrance of the germs.

Dr. W. H. Hutchings, Detroit: The question of postoperative tetanus is so large that it cannot be given full consideration in the time at our disposal. However, I desire to call attention to the fact that surgeons, when anything goes wrong, are altogether too ready to blame catgut. They forget that catgut can be sterilized, no matter how large it is, and

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forget that the patient's skin and their own hands are not so easily made sterile. There are undoubtedly cases in which the catgut has been the cause of tetanus and quite as many cases in which the catgut has been sterile, and cases in which catgut was not used at all. Unfortunately, Dr. Peterson had no cultures made, so we do not know whether his cases were those of tetanus or not. The question of treatment is a very important one. As Dr. Peterson says, the mortality is about 80 per cent. It has been lowered somewhat. For several years I have been conducting a series of experiments on sheep to study the methods of treatment that have won any recognized place. An important statement was made in a paper by Dr. Matas, at the recent meeting of the American Surgical Association, calling attention to the fact that often tetanus spores are taken into the body with salads and fruits, and eliminated in the feces, and that a large percentage of post-operative tetanus is found in cases in which the parts have been contaminated in that way; notably in the operation with clamp and cautery in hemorrhoids. I have become convinced that the best way to control the manifestations of the disease is by the use of chloretone. For the cure of the disease we must remove the source of the manufacture of the toxins. The toxins in the body are better neutralized by the antitoxin if it is used intravenously, though the antitoxin has no effect whatever if the toxins are already in contact with the nerve cells. The first problem is to keep the patient alive until the toxins can be overcome. I have treated six tetanus patients with chloretone for the control of the convulsions and have cured five of them. One was a case of abortion induced by curettement in which tetanus developed in six days. One case was a Fourth-of-July accident. Another case was that of a man who had a severe crushing injury to the hand. Several operations were done but the flaps sloughed and tetanus developed. Another case developed from fracture of the elbow. The man could not swallow. The serum was given and he was also given large doses of chloretone. He was so completely relaxed that all one night a nurse had to sit by the bed to hold his jaw forward so that he could breathe. Chloroform kills by paralysis of the center of respiration. Chloretone will control the convulsions, but that is all it will do. It is comparatively harmless. In one case a man took a large dose with suicidal intent. He slept for a week, woke up, and said he felt perfectly well.

Dr. H. J. Boldt, New York City: I have been unfortunate enough to lose two patients as the result of tetanus. An examination of the catgut gave a negative result. Then I had some catgut from the same manufactory infected with tetanus and anthrax bacilli. The catgut was untwisted and the infection made in the center of the gut, which was No. 3. The tubes were sealed in the presence of the bacteriologist. The

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manufacturer then put them through the same process as all the other catgut underwent, and it was then returned to our bacteriologist. A careful examination was made and it was found to be absolutely sterile. So that settles the question that my patients did not die from infection in the catgut. One case was a large ovarian tumor; the other a large fibromyomatous uterus.

Dr. W. H. Hutchings: Regarding the work of Wassermann, I should like to call attention to the fact that Villard has reported thirty-one cases of undoubted tetanus following the prophylactic use of serum.

Dr. C. C. Fredreick, Buffalo: I want to report a case of postoperative tetanus, the only one I ever had, which occurred in my hospital last September. It was a perfectly clean case of myofibroma for which I did supravaginal hysterectomy, the wound closing by primary union. The patient developed tetanus on the sixteenth day. I was doing a lot of work at the time. I have continued to use the catgut prepared by the iodin method. I operated on three patients on the same day that this woman was operated on and the others did not develop tetanus. I suppose that my catgut might have been the cause, though I doubt it very much. This patient did not develop tetanus until the sixteenth day after operation. The largest catgut used was No. 2. About five days prior to the beginning of the tetanus the woman had an attack of acute indigestion with diarhea, furred tongue, elevation of temperature, etc. After two days with catharsis and withholding of food she recovered. The woman was very fond of fruits and vegetables. The attack occurred in September at a time when she was eating a great many of these things, and I have an idea that she was infected from the intestinal tract.

Dr. Reuben Peterson, Ann Arbor: In the time permitted I could only read my paper in abstract. About everything brought out in the discussion appears in the body of the paper and I would refer those interested to the paper itself. I am not trying to prove anything at all. I would much rather not have it proved that catgut is the source of infection. After a period of seven or eight years with the use of one catgut I changed to another sterilized by a different method and this case of tetanus developed. That is enough proof for me so far as my own surgical practice is concerned. It is difficult to prove that the catgut is at fault. It has been shown that only one fiber of the catgut need be infected. Such infection cannot be very common, because if it were, we would get all sorts of infections throughout the world when so much catgut is being used. If I have pointed out the possibility of tetanus following clean operative cases and shown the importance of careful supervision of the sterilization of catgut, I shall have accomplished my purpose. Of course we know the value of the serum as a prophylactic

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measure, but it must be remembered that we do not give all our operative patients antitetanic serum lest they have tetanus. The serum does neutralize the toxins as Dr. Hutchins has pointed out, and therefore should be used in the treatment in every case. Very seldom, I think, does tetanus develop from infection on the hands. If we look at the different methods of sterilization of hands, instruments and of all materials connected with the operation and see how few cases of tetanus develop, it must be very rarely that the source of infection is there. However, the infection is much more common than one thinks, as evidenced by the twenty cases of Richardson and the fifty cases since 1890 which I have collected. Chloretone, of course, is used merely as an antispasmodic, and is much safer and more effective than chloral or other drugs which have hitherto been employed. It acts so beautifully in relaxing the muscular spasm that I would advise any one so unfortunate as to have a case of tetanus, postoperative or otherwise, to give it a fair trial. It was extremely gratifying to note the relaxation of the muscles and the ability of the patient to open her jaws, following a dose of 50 grs. of chloretone.

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CYSTOCELE

A RADICAL CURE BY SUTURING LATERAL SULCI OF VAGINA TO WHITE LINE OF PELVIC FASCIA

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SAVANNAH, GA.

Ahlfelt states that the only problem in plastic gynecology left unsolved by the gynecologist of the past century is that of permanent cure of cystocele.

That these cases recur after operation is too well known. The late Paul Numde states that all of his cases ended in failure and he had given up operating for that condition. The reason for failure seems to be that the normal support of the bladder has not been sought for and restored, but instead an irrational removal of part of the anterior vaginal wall has been resorted to, which could result only in disappointment and failure.

The support of the bladder may readily be determined in the cadaver by making a suprapubic incision and attempting to push the bladder out through the vulva. It will be found to rest on the anterior vaginal wall to which it is slightly adherent. If the bladder be pushed aside and an attempt made to push the anterior vaginal wall back toward the perineum its support comes out very plainly. It is attached to the symphysis pubis and pubic bones in front, laterally to the white line of the pelvic fascia and ischiatic spine; and, above and behind, to the uterus. The uterus, being freely movable, is no important factor in the case and the real support of the vagina comes from its attachment to the white line of the pelvic fascia and especially a thick bundle of fibers attached to the spine of the ischium and radiating out on both the anterior and posterior surface of the vagina.

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If the fibers along the white line, and especially those originating from the spine, be cut across, the vagina falls down and can be pushed out of the vulva in the manner of a cystocele. It is, therefore, evident that a cystocele is caused by the breaking loose of the vagina

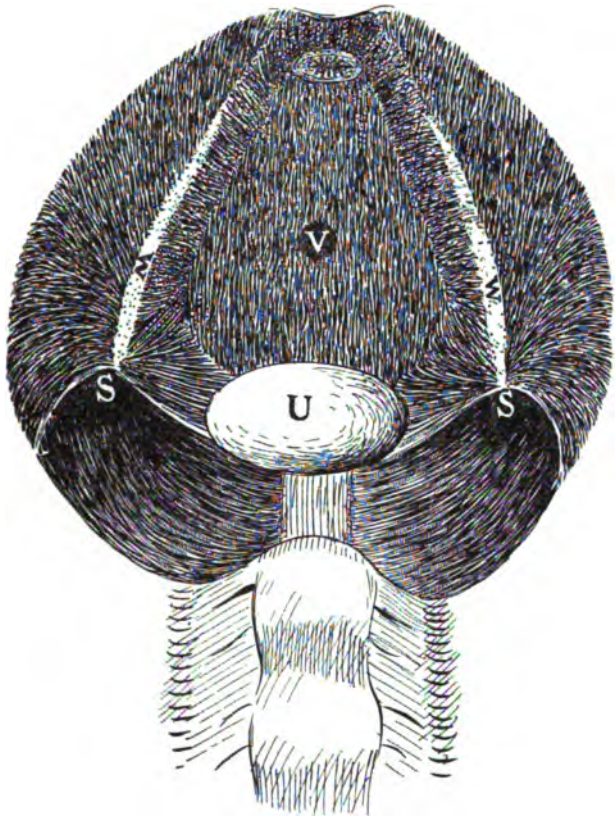

Fig. 1.—Attachments of the vagina seen from above; (u) uterus; (s) spine of ischium; (w) white line; (v) vagina.

from the white line which can readily occur during labor and especially in an instrumental delivery.

I have recently had an opportunity to observe the actual occurrence of this lesion in a case of instrumental delivery for eclampsia, in which a laceration run-

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ning along the lateral sulcus of the vagina laid bare the spine of the ischium, and separated the vagina from its attachments. Had the patient lived, she would undoubtedly have had a cystocele.

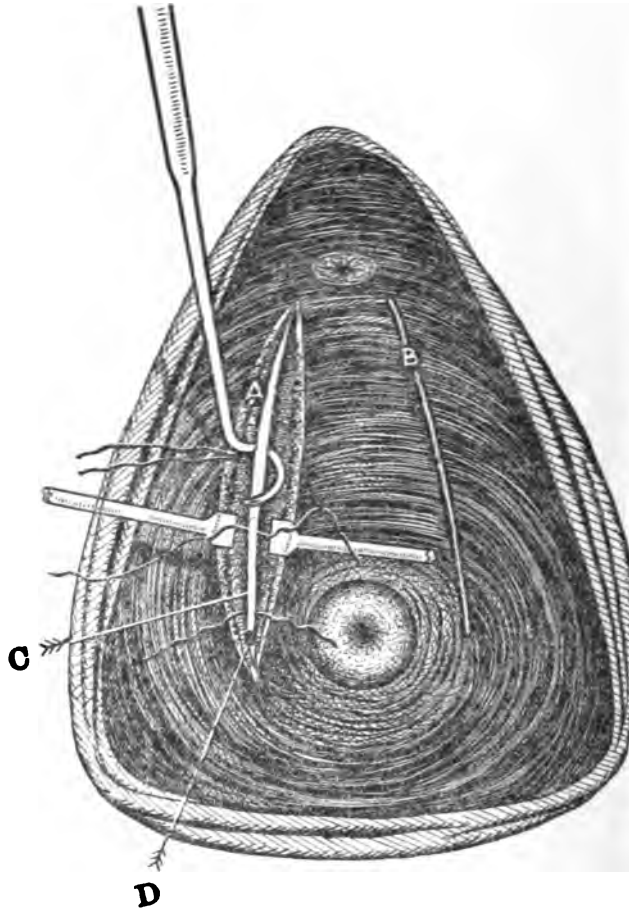

Fig. 2.—Passing of sutures (a) back of the white line by Deschamp's handle-needle; two sutures in place; incision (b) from lateral sulcus of vagina to side of urethra; (c) white line; (d) spine of ischium.

In another case of a young primipara delivered by forceps without any laceration, except a small tear along the lateral sulcus of the vagina, a complete cystocele

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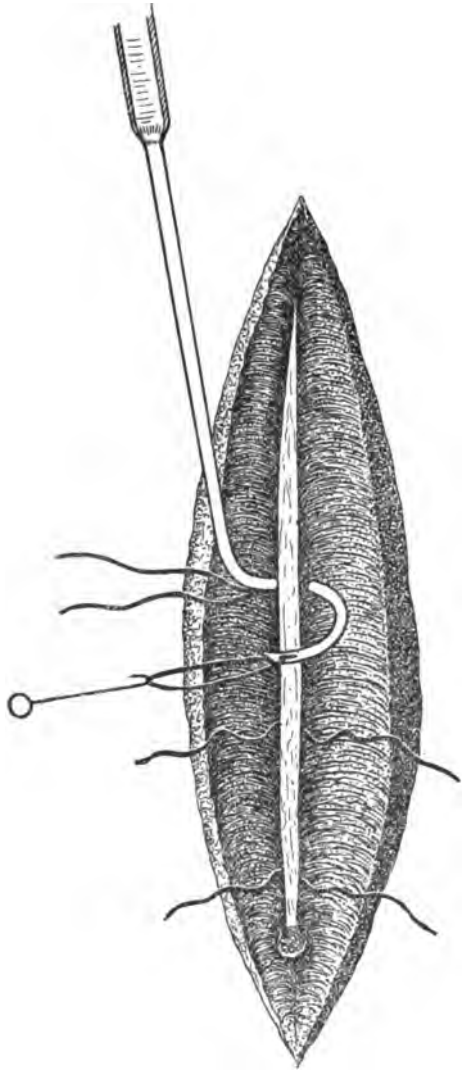

Fig. 3.—Passing suture behind the white line by the Deschamp's needle; drawing out a loop of the thread by hook.

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developed within a month, although the perineum was intact and the uterus was in normal position.

In the treatment of cystocele the object in view is to reattach the vagina to the white line of the pelvic fascia, especially at its origin from the ischiatic spine, which can be accomplished through the vagina without any great difficulty.

The vagina is held open by two retractors, the ischiatic spine located by palpation, and an incision from

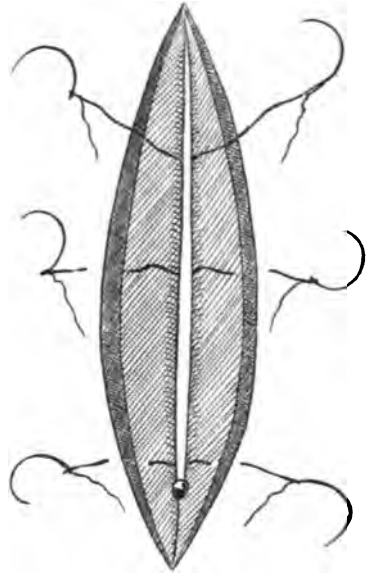

Fig. 4.—Suturing the lateral sulcus of the vagina to the white line.

one to two inches long made through the mucous membrane, parallel to the white line, and extending well up the vagina. The bladder is separated from the vagina by blunt dissection until the spine of the ischium and white line are reached and can be felt uncovered beneath the finger. Hemorrhage is seldom troublesome and can be controlled by a few minutes' pressure. The sutures,

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which are of chromicized catgut, are passed under guidance of the finger by a Deschamps handle-needle.[1]

The first suture goes back of the white line just as it joins the spine of the ischium. The handle-needle is taken off, and each end of the suture threaded on a separate needle; one needle is passed from within out through the median edge of the incision, taking a firm hold on the vagina; the other needle is passed in a

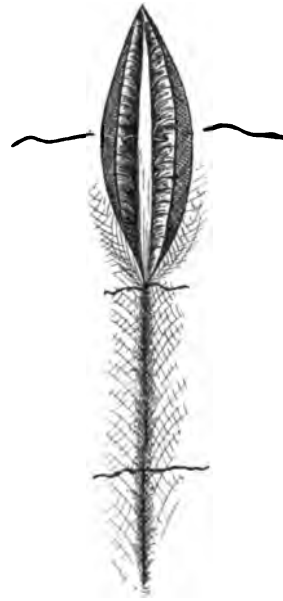

Fig. 5.—Closing the wound; two sutures tied.

similar manner through the lateral edge of the incision. The two ends are then clamped and are ready to be tied. A similar suture is placed half an inch lower down on the white line, and when this is in place both sutures are tied, bringing the lateral sulcus of the vagina in contact with the white line of the pelvic fascia.

Should there be any prolapse at the outlet of the vagina, the incision may be extended down alongside of

1. I make use of a Deschamps needle, described by Charles Peck in his article on cleft palate, Annals of Surgery, January, 1906, xxliii, 10.

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the urethra and the vagina sutured to the dense fascia covering the pelvic bone. The opposite side is treated in a similar manner and when both sides are tied the anterior vaginal wall is drawn up in a normal position. and has no tendency to sag, even when the patient coughs or strains. The vagina reaches across from one ischiatic spine to the other, without any tension; it collapses when the retractors are removed and normal relations of the parts are restored.

The operation is always done in combination with other plastic operations, and does not interfere in any way with them, nor does it minimize the caliber of the vagina, which is a matter of importance should extensive denudations be contemplated in the cure of a rectocele.

The immediate effect of the operation is satisfactory. There is no great amount of pain; dysuria, if present. passes off in a few days. The patients get up in from ten days to two weeks.

I have performed the operation nineteen times in the past three years, always in connection with some other plastic operation. No recurrence of the cystocele has taken place, so far as I have been able to determine. though some of the patients could not be followed.

The operation presents the following advantages:

1. The normal supports of the bladder and vagina are restored.

2. There is no sacrifice of tissue.

3. Recurrences are rare and are due to faulty technic rather than faulty principles.

4. The operation is done without interfering with any other plastic work about the vagina.

4 Liberty Street, West.

ABSTRACT OF DISCUSSION

Dr. H. Grad, New York City: At the Woman's Hospital in New York we have passed through a series of stages in plastic surgery. It was in this place that Sims began his plastic surgery, followed by Emmet, Thomas, Peasley and others.

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We formerly operated there on a plan devised by Emmet of denuding the anterior wall of the vagina in cystocele with the addition of a suture Emmet devised. A denudation is made on either side of the cervix and also in the median line on the anterior wall of the vagina, and when these three denudations are brought together the cervix is pushed into the hollow of the sacrum. That was the first principle of a successful operation on the anterior wall as practiced in the Woman's Hospital. This operation was done for a great many years, but we had a great many recurrences. Within the past few years another method has been followed there, and that is the method of Dr. J. Riddle Goffe. In this operation a longitudinal incision is made from the urethra to the cervix on the anterior wall of the vagina and a transverse incision along the cervix. These two incisions open up the entire anterior wall of the vagina, the bladder is dissected off, which is a very important point, because the bladder wall becomes adherent to the anterior wall of the vagina in a way that is vicious. Dr. White did not mention cystocele where no traumatism has occurred. In the unmarried woman there is no traumatism, but a gradual loss of the support, and the result is cystocele. By dissecting off the bladder as practiced by Dr. Goffe, we find that we get absolutely perfect results. He sutures the base of the bladder to the anterior wall of the uterus with three fine catgut sutures to hold the bladder out of place. The pelvic fascia is brought together in the same manner as one does in operating for a hernia.

It seems to me that the operation described by Dr. White is a very good one because it is based on good principles, but I believe that unless the bladder is at the same time separated from the anterior wall of the vagina there will be some recurrences.

Dr. C. W. Barrett, Chicago: The principles on which cystocele is treated must be based on the fact that cystocele or rectocele, or prolapse of the uterus is a hernia through the pelvic floor, and we must take into consideration the supports of the pelvic organs and the abdominal organs as well. The viscera, including the pelvic organs, are supported by ligaments and then by a limiting wall, and that limiting wall grows in importance as it goes downward. The pelvic floor is in the unfortunate position of having to play fast and loose, of having to be a most important part of the abdominal wall, because it is the lowest, and it must allow the passage of the child's head which distends the soft parts of the pelvic floor to the extreme limits of the bony parts; and these muscles must again contract so as to serve as the most important part of the abdominal wall. When important structures run through the abdominal wall, as we see in the inguinal region, instead of running straight through, they run

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through one part, then along the wall obliquely and then through the remaining portion of the wall. In the lower animals, the canal being more oblique, we have less tendency to hernia. As the intra-abdominal pressure increases, the pressure of the internal layer is against the external layer. In animals that walk on all-fours, very little of the pressure comes on the perineal region. In the higher class of animals and in man the muscles which have no use as tail muscles form in the median line the levator ani muscle. Occasionally in an individual we see, without trauma of the pelvic floor, that the muscle presents almost no fibers meeting in the median line, so that no support is derived therefrom and a tendency to hernia is created by reason of atavism of the muscle. We find that the patient needs a perineorrhaphy just as badly as the patient who has had a traumatism of the pelvic floor. To cure cystocele and rectocele we must do several things: 1. Create a good strong pelvic floor, that does not depend on any skin operation nor on a mucous membrane operation. It is herniotomy; going in and getting hold of the levator muscle which has been formed in the upright animals, but which has been displaced by traumatism or which has never met in the median line. 2. We must put the vagina out of a perpendicular line so that the anteior segment rests on the posterior. 3. If the vagina is so loose that no matter how good a pelvic floor we make, it would gradually work out over the perineum, we must do something with the vaginal canal; and it may be that this method is a good one. I have had no reason to discard the method of taking out an eliptical piece in the anterior wall; not a scarification, but a deep dissection of the anterior wall and bringing it together. 4. We must not only do these two things, but we must put the uterus out of line with the vagina. If we leave the uterus in line with the vagina it will dissect its way down through the vagina again.

Dr. I. S. Stone, Washington, D. C.: I agree with Dr. Barrett that there are two very strong "floors," or a division of one floor into two. It is very easy to understand this if we make a dissection from below or above, that the upper plane of this floor, as well as the lower, has strong bundles of fascia which may be demonstrated. If any one will make this dissection they will never fail to utilize it in an operation for cystocele. I can not understand how anyone, after these several years of advanced pelvic work, can continue to use a method denudation. Suppose we have only this upper "floor," as Dr. Barrett has said. If the uterus be left in such a position with the small end forward it will eventually prolapse. But if the uterus be so placed that the fundus is forward and the cervix backward, and in addition to the cystocele operation a proper perineal operation be performed, the patient is cured.

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Dr. A. Goldspohn, Chicago: About seven years ago I published an article, with illustrations of the technic, entitled, "Intrapelvic and Infravaginal Perrineorrhaphy, Without Loss of Tissue." I am glad that correct anatomic principles are finally gaining ground, with the profession, in regard to this operation; because until recently, this operation was in most hands a very superficial and incomplete performance, merely a cosmetic affair, which really improved the condition of the woman very little. As I pointed out in my first article on the subject, a German first called attention to the correct anatomy of the levator ani muscle, and its important function in this regard. I have wondered for years why it was that his countrymen did not incorporate his correct anatomic principles in their surgical attempts at perrineorrhaphy. I was recently informed by one of them, that it was because they did not have buried suture material. But we have had absorbable sutures for a number of years and have been rather slow in this country in grasping the proper scope, of this operation, and in bringing an efficient technic into general use. Recently Dr. Barrett has become active in this matter, and he practically advocates the same principles, that I have contended all these years. The play of normal forces in a woman's pelvis, is such, that when she strains, that is when intra-abdominal pressure is exercised, the pressure strikes the vaginal tube, sideways from above, the body of the uterus being during the same time, driven forward, in intensified anteversion. The anterior vaginal wall is driven against the posterior vaginal wall, which in turn is or should be driven against the pelvic diaphragm, the levator ani below. In that manner the vaginal tube is closed against the descent of anything through its lumen by evagination. The bridge of the levator ani muscle which normally passes from one side to the other, back of the vagina and in front of the rectum, is best restored when it has been injured, by temporarily raising the posterior vaginal wall, and then uniting the important structures by purely transverse buried sutures, and then adjusting the detached vaginal wall in folds on the new bridge.

Uterine prolapse in this country being almost altogether in women past childbearing years, or in those who are willing to surrender that function, can be treated very successfully as a rule, by combining a vaginofixation or a ventrofixation of the uterine body or fundus, (by a fibrofibrous union), with a thorough restoration of the anatomy of the levator ani muscle as a pelvic floor or diaphragm. Moderate cystocles require no other treatment than the building up of such a normal support for them from below. When they are very marked or large, however, it is usually necessary to attack the anterior vaginal wall, also to give the bladder a new location higher up or on the fundus uteri, where it can not again

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invite the disorder, and to abbreviate the expanded anterior vaginal wall. The latter is better done not by resection, but partly at least, by sliding a flap of one side under that of the other side, after appropriate detachment, and denudation, thus doubling this wall, over the median area, where it was formerly most attenuated.

Dr. G. R. White, Savannah, Ga.: I have been surprised many times in working out this subject to follow the logic of many of the operations recommended for the cure of cystocele. Everything as recommended except repair of the anatomic supports of the bladder. The problem of keeping the bladder in place is solved in repairing the shelf on which it rests. Otherwise I do not see how we can expect to cure cystocele. The point of great importance is that the pelvic organs are a unit. It will not do to repair one part and let the others go and expect to get a cure. There is no use in repairing a cystocele and leaving a relaxed perineum and prolapsed uterus.

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A METHOD OF COMPLETE NEPHROURETER-ECTOMY IN WOMEN

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WASHINGTON, D. C.

Removal of the kidney and ureter simultaneously is closely associated with nephrectomy, an operation first planned and successfully performed by Simon, in 1869. I have failed to find by frequent surveys of the literature of this subject during the past ten years any records of nephroureterectomies that necessitate alterations in the tables and case references contained in my paper read before the Southern Surgical and Gynecological Association in 1899.[1] This table credited H. A. Kelly, of Baltimore, with performing the first nephroureterectomy, Dec. 18, 1895, for tuberculous ureter. During the following month the late A. J. McCosh, of New York, performed the operation for tuberculosis of the kidney.

ROUTES

Early in the history of this operation the two principal routes employed were the loin extraperitoneal and the transperitoneal. The greater danger of infection that frequently attends the transperitoneal route would reasonably prevent its selection. In 1901 I collected reports of fourteen cases for a paper read that year.[2] Three cases were added to these, making seventeen in all, in my paper of 1903.[3] Seven of the operations had been performed by the loin extraperitoneal, five by that

1. Bovée, J. W.: South. Surg. and Gynec. Assn., 1899, xii, 14.
2. Bovée, J. W.: Tr. South. Surg. and Gynec. Assn., 1901, xiv, 201.
3. Bovée, J. W.: Am. Gynec., 1903, ii, 311.

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route plus the vaginal and five by the transperitoneal. Kelly, Noble, Montgomery, Ill and myself have recommended the loin extraperitoneal and the vaginal, but no two recommended the same technic.

I shall not discuss the indications for removal of the lower end of the ureter, for they are probably familiar to all. In many cases exsection of the vesical portion will not be necessary, and in some even ligation of the stump of the duct next the bladder wall will not be necessary. But for dealing with the lower two inches of it, particularly for its removal in women, the vaginal incision offers the greatest facility except, possibly, in the virgin. Most operators employing these two combined routes have begun with the renal end by an incision through the tissues down to the ureter parallel to that duct, and making the vaginal incision late in the procedure.

Montgomery[4] made the vaginal opening first, having in view ligation and division of the lower end of the ureter and facilitating upward removal of the lower end by traction, but he abandoned the attempt and proceeded from the loin. Another modification made by him was the employment of the transverse loin incision of König.

Ill[5] removed the kidney through a loin incision, dissecting the ureter well down, and made a second incision in the semilunar line, just above the pubes. Through the latter the peritoneum was pushed back until the iliac vessels were reached, continuing the dissection of the ureter to the iliac artery. He then tied the uterine artery in front of his finger and the internal iliac artery behind it, opening the vagina along the line of the ureter, which was completely loosened. The ureter was finally ligated and severed and the lower part drawn into the vagina, where it was ligated next the bladder and removed.

4. Montgomery: Tr. Am. Gynec. Soc., 1900, xxv, 290.
5. Ill: Tr. Med. Soc., New Jersey, 1899, p. 83.

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G. H. Noble[6] removed the kidney and ureter in one piece, separating the kidney and upper portion of the ureter through the loin incision, and after separating the lower portion through a vaginal incision pulled it upward and out through the loin wound. Nov. 24, 1897, Garceau[7] did a ureterectomy, a month after a nephrectomy, in which he loosened the ureter to the broad ligament from above and then through a vaginal incision pulled the duct, severing its attachments and removing it after ligation.

Nov. 7, 1902,[3] in doing a complete nephroureterectomy, I began it by making an incision through the anterior vaginal wall to the ureter, which structure was loosened to its entrance into the broad ligament posteriorly, ligated next to the bladder and severed. Then through the usual loin incision, five inches in length in this instance, the kidney and ureter were separated and removed. In reporting this case[3] on page 320, I referred to the vaginal route being first used, as follows: "This plan I had believed to be best, and when I saw Montgomery do it, although he failed to ligate the bladder end of the ureter, I was convinced." I also recommended the König incision.

TECHNIC

I then adopted the following technic, which has been employed in each instance. Below appears the histories of four cases operated on by it.

The patient is put on the operating-table in the Simon position and the loin area prepared for operation. The preparation of the perineum, vulva, pubes and vagina as for any vaginal operation is now made. The anterior vaginal wall is next exposed and a vulsellum grasps and pulls the cervix downward and toward the introitus to locate the interureteric ligament. On the vaginal wall, exactly opposite the ureterovesical junc-

6. Noble, G. H.: Am. Jour. Obst., 1900, xli, 462.
7. Garceau: Boston Med. and Surg. Jour., 1899, cxli, 655.

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tion, will now be seen a small dimple. From the outer side of this dimple an incision is made downward and outward along the course of the ureter. It should be from one to one and a half inches in length. By careful blunt dissection the ureter is easily exposed and hooked down. If it be considerably enlarged, as it commonly is in tuberculous cases, this procedure is very easy. A metal hook or a piece of suture material is passed around it, and gentle traction made on it facilitates its liberation through the broad ligament. If it is very large, one-half to three-fourths of an inch in diameter, it may be advisable either to ligate or to clamp and sever it, after which it becomes more mobile and can be moved far outward to facilitate its liberation. If exsection from the bladder be thought desirable it may now be done, one layer of sutures being placed first, and the second, if deemed necessary, after the exsection is made and the first layer of sutures tied. A ligature is now placed on the free end of the ureter if a clamp was used.

The patient is next changed to the supine position, and opposite the lower pole of the affected kidney a transverse (König) incision four inches or longer is made through the extraperitoneal portion of the abdominal wall. Its inner end need not be inside the semilunar line. The kidney is now liberated and brought out through this incision and its vessels clamped or tied either before or after it is brought out. By gentle traction on the kidney the fingers are assisted in separating from surrounding structures the ureter to the pelvis, and it is pulled out of the wound with surprising rapidity and facility. If careful dissection has not been accompanied by escape of pus from the kidney or ureter or from a perinephritic abscess, little attention to drainage will be necessary. In my cases I have in two instances felt compelled to employ both loin and vaginal drainage. In the others a piece of gauze has been pushed, by means of a uterine sound, downward along the ureteral tract through the vagina and the vulva,

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only a strip being left in the abdominal portion of the cavity created by the operation. The loin wound in such cases was completely closed by buried animal sutures. The illustration shows the appearance of the cicatrix when the dressings were removed two weeks after operation. The gauze protruding from the vagina is usually removed fractionally by daily pulling it down after the second day. If loin drainage is used it is preferable frequently to employ the stab wound space for it and close the König incision entirely.

This plan markedly reduces the duration and traumatism of the operation, two points of great consideration in very delicate patients. It facilitates to a remarkable extent liberation of the lower portion of the ureter, provides simple and dependent drainage, permits removal of the kidney and ureter in one piece; allows closure of the wound, except when much pus is spilled; does not exhaust the patient by changing her position during the operation—often a waste of time—and simplifies the preparation of the patient for operation. It does not require any special apparatus for detection of the lower end of the ureter or for its exposure and liberation, although Hawkes[8] considers catheterization of the affected ureter an important preliminary step. The loin incision usually heals promptly and with a small cicatrix.

REPORT OF CASES

CASE 1.—*Patient.*—Mrs. B., white, aged 31, primipara, was referred to me by Dr. I. F. Watkins, of Montgomery, Ala. Patient had been ill nearly two years; during this time she had suffered with an unbearable burning and aching sensation over the area of both kidneys, over the bladder and along the course of the right ureter; she had had chills, fever, night sweats and had lost considerable weight.

Examination.—An *x*-ray examination was made by Dr. Ervin, no evidence of the presence of calculi being found. She was then sent to Columbia Hospital for Women, and on July

8. Hawkes, E. Z.: A Method of Complete Nephroureterectomy for Renal Tuberculosis in Women, THE JOURNAL A. M. A., Aug. 8, 1908, li, 459.

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8 an examination was made under anesthesia. The right kidney was found to be below the ribs and enlarged to one and a half times the normal size. The lower three inches of the right ureter was enlarged and nodular; the left kidney and ureter seemed to be normal in size and position. Segregation of urine by means of Harris' segregator showed tubercle bacilli of the right side, the bladder was much thickened and the urine contained pus and blood.

Operation.—On July 12, 1907, nephroureterectomy was performed. Through a vaginal incision in the right broad ligament the ureter was ligated close to the bladder and separated from that viscus and broad ligament. The abdominal incision, about four inches in length, was made transversely about two inches below the last rib and included about one inch of the anterior margin of the quadratus muscle. After isolating the kidney and the remaining portion of the ureter from above these structures were removed through the abdominal incision in one piece. The peritoneum was accidentally opened at one point not more than one-tenth of an inch in diameter, which was closed with catgut suture. With the exception of a piece of gauze running through the vulva and vagina into the broad ligament opening, no drainage was used. The right kidney was enlarged and contained a number of pockets in which was flaky and cloudy urine; the enlargement of the kidney was found to be not more than 25 to 50 per cent.; the right ureter was enlarged in some places more than others. This enlargement existed close to the bladder and one inch below the pelvis of the kidney. A slight enlargement of the vesical portion of the left ureter was noticed.

Recovery.

Case 2.—*Patient.*—Mrs. H. B., white, aged 41, had one brother who died from an unknown cause; her father died forty years ago of pulmonary tuberculosis. She has a son aged 3 with suppurating cervical glands, believed by her family physician to be tuberculous. She suffered from an abscess of the breast just after her eighth and last confinement, in February, 1907. This abscess had to be lanced several times and required four months for its cure, during which time she had chills and fever. In the following August she suffered from pain in the bladder and frequent micturition, noticing several times slight discoloration of the urine with blood. December 12 pain in the bladder was severe and she expelled from it several ounces of pus with entire relief. In January, 1908, and each month afterward, she suffered a similar attack. Frequently after August, 1907, she had noticed blood but not pus in the urine. Early in October, 1908, she suffered from an-

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Cicatrix two weeks after operation.

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other attack of chills and fever and noticed a swelling in the left side of the abdomen, and that while lying on the bedpan and pressing on the swelling pus would escape from the bladder with the urine. The patient thought that she had lost fifty pounds in weight since the birth of her child.

Examination.—This revealed an enlargement about six inches in length in its longest diameter in the region of the kidney and, extending from it to the bladder, the ureter was enlarged to about one and a half inches in diameter throughout its entire course. The bladder wall was much thickened. Urinalysis showed a large amount of pus, which on segregation, was limited to the affected side. Several bacteriologic examinations failed to demonstrate the presence of tubercle bacilli. Nevertheless, the diagnosis of tuberculosis of the left kidney, ureter and bladder was made.

Operation.—On Nov. 6, 1908, the kidney and ureter of the left side were removed by the method already mentioned. Longitudinal incision of the kidney after its removal showed at least ten pockets filled with thick blue pus; the ureter contained pus of the same appearance. Two sections of the kidney were examined by the pathologist who reported negatively as to tuberculosis both as to tissue and contained pus. He considered it a picture of pyelonephritic abscess formation and purulent infiltration.

The patient made a very good recovery.

CASE 3.—*Patient.*—Mrs. A., aged 25, Russian, secundipara, admitted to Columbia Hospital for Women, Dec. 3, 1907, for pain in the right side and irritability of the bladder. She had passed bloody urine and had missed three menstrual periods.

Examination.—A cystoscopic examination found the bladder mucosa markedly reddened, the bladder wall thickened, both ureters palpable through the vagina, the right being the size of a lead pencil and hard and the left smaller and not so distinct. Through the abdominal wall the right could be felt all the way to the kidney, the left was not traceable in this manner. A mass was felt in the region of the right kidney of about twice the size of that organ, as the uterus was considerably enlarged pregnancy was diagnosed, she was kept under observation until Jan. 11, 1908, when she left the hospital to which she returned at the time of the birth of her child, May 15.

She was readmitted to the hospital Oct. 20, 1908, suffering with pain in her right side, in the bladder and frequent and painful micturition. The abdominal mass had now increased to a size in excess of that of the head of a new-born infant.

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Operation.—Examinations in this instance were negative as to tuberculosis, and on November 10, 1908, complete nephoureterectomy was done by the method described in this paper. The right kidney, about 10 inches in length and about 12 inches in transverse circumference, contained many separate abscesses beside purulent inflammation of the calyces and pelvis of the kidney. The pus was very thick, and in some instances granules of a pale blue color were noted. No calculi were found. The ureter was 1/2 to 3/4 inches in diameter, though having but little more than usual measurements at the lower end and one inch in diameter at the upper end. The transverse incision was directly opposite the umbilicus and about six inches in length.

Recovery.

CASE 4.—*Patient.*—M. B., aged 29, colored, multipara, was admitted to Columbia Hospital for Women, Jan. 4, 1909. She was suffering from frequent micturition attended by pain at the beginning and ending of the act, which had existed nine months. Blood had usually been noticed in the urine during the past month.

Examination.—The left kidney and ureter were slightly enlarged, the bladder thickened and inflamed and tubercle bacilli were found in the urine from that side. The daily quantity was 705 c.c.

Operation.—Jan. 19, 1909, nephroureterectomy was performed by loin extraperitoneal and vaginal routes. The peritoneum was opened for a half inch accidentally and inspected near the opening. It appeared normal and the wound was at once closed. A thickened and nodular ureter and a pyonephrotic kidney were removed in one mass and without leakage.

The patient gradually failed and died March 1, 1909. At an incomplete necropsy next day the following points were noted.

Postmortem Examination.—The parietal and visceral peritoneum were generally and thickly studded with small, white, pinhead-sized tubercles which were most numerous around the area from which the kidney had been removed and the adjacent coils of intestine. Adhesions were rather numerous and firm. A small quantity of yellow pus was present in the pouch of Douglas. The right kidney, small, soft, and somewhat injected, appeared to have undergone some parenchymatous degeneration, but there were no gross lesions of tuberculosis. The walls of the ureter were not thickened. The bladder wall was thickened and the interior studded with older tubercles and ulcers. The lungs, liver, heart and spleen were all pale, soft and bloodless, in harmony with the emaciation presented.

The Rochambeau.

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THE PATHOLOGY OF ECLAMPSIA AND TOXEMIA OF PREGNANCY

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The pathology of eclampsia is a subject that has interested the obstetrician since the beginning of his art. Before the days of postmortem research and urinary analysis the imagination of the practitioner formulated a pathology for this affection which was deduced from clinical symptoms. In the process of reasoning backward from effect to cause, few persons will follow the same course; therefore, radically different judgments are formed. Thus we have had many different explanations of the causes producing the ensemble of symptoms which have so long been called eclampsia. The chief and one essential symptom of the condition is convulsions, with which certain others may be associated in a more or less pronounced form.

Until very recently these have been required always before diagnosis should be pronounced. Even now it is an exceptionally bold diagnostician who will venture the diagnosis of eclampsia without the presence of convulsions.

Early in the era of postmortem studies in this condition, hope arose that the true explanation of the condition was at hand. Attention was largely centered on the central nervous system as the seat of the affection, since the main symptom seemed to point to that center. Changes in the brain which were given to account for the convulsions were anemia, edema, and apoplexy.

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These observations were very good as far as they went, but lacked in comprehensiveness.

In 1886 Jurgens by his careful labors placed the pathology of eclampsia practically in the position it now occupies. It is to him that we owe our first description of the hemorrhagic liver changes now so well known and thoroughly identified with this condition. In addition to the liver changes, he also gave an account of thrombi and liver cell emboli in the lung capillaries.

Stimulated by these findings, others devoted particular attention to the subject and as a result we have valuable contributions from Klebs, Pilliet, Lubarsch, Prutz, Gerdes, Schmorl and others who have redescribed the hepatic hemorrhages and associated them with necrosis of liver cells and thrombosis of vessels. In addition, they have shown us thrombi in other organs and emboli composed of liver and giant cells which they have described as being derived from the placenta.

The picture now accepted as typical of the pathology of eclampsia by the greater number of those familiar with the subject consists in hemorrhages in and about the portal spaces, thrombi in vessels of the liver, and giant cell emboli in other organs. These changes found postmortem in the pregnant or postpartum woman are considered by many as a justification of the diagnosis of eclampsia regardless of the presence or absence of convulsions before death. And it is with these changes in mind that the clinician will occasionally make the diagnosis of "eclampsia without convulsions."

Toxemia of pregnancy is a name obstetricians have for several years been applying to a symptom-complex characterized for the most part by headache, visual disturbances, nausea, vomiting, delirium and coma with or without edema. This group of symptoms which appears to have its origin in a more or less profound systemic poisoning, has been considered as an affection entirely apart from and independent of eclampsia because of the absence of convulsions.

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During the development of the pathology of eclampsia by the above-named investigators, it was discovered that many pregnant and postpartum women dying from a systemic poisoning manifested by the above symptoms, with occasionally convulsions added, showed different lesions from the ones above described in connection with eclampsia. Instead of hemorrhages about the portal spaces associated with thrombi and emboli, extensive necrosis was found associated with advanced degenerative processes which when found early were limited to the central part of the liver lobule, but later invaded the remaining part of the lobule and produced a picture typical of acute yellow atrophy of the liver.

In the evolution of this subject, two sets of views have developed: one that the two conditions are entirely different diseases, eclampsia having hemorrhages about the portal spaces as its characteristic lesion and toxemia having central necrosis of the liver lobule as its characteristic lesion. The other view holds that the two conditions are different manifestations of the same disorder. Excellent contributions to both sides of the subject have been made in this country by Dr. Williams of Baltimore and Dr. James Ewing of New York.

I am presenting, in a limited way, the findings in fourteen cases which I have examined postmortem at the New York Lying-in Hospital, in the wards of which they were observed clinically. The diagnosis given in each case is that made by the clinician and not from the postmortem findings in the liver. In each case put in the class of eclampsia there were convulsions. In each case put in the class of toxemia of pregnancy there were no convulsions, but signs of systemic poisoning.

Before generalizing on the lesions found, it may be of interest to give details of the histories of four of the series, in which the most extensive hemorrhagic changes were found.

Case 3.—Eclampsia. Hemorrhages (Path. No. 887).

***Patient.*—Aged 21, primipara.**

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History.—This patient had never been ill. She had no morn ing sickness with present pregnancy. Five weeks before confinement she had slight morning headaches and swelling of the legs. Three weeks before confinement the headaches had stopped and the swelling diminished. There was a trace of albumin in the urine. At full term she gave birth normally to twins at 7:30 p. m., and had a comfortable evening until 11 o'clock, when she was suddenly seized by a general convulsion followed by coma, in which she died eight hours later.

Autopsy.—Body shows general edema, slight over the trunk, but marked in the feet and legs. No jaundice.

Brain: All the ventricles are filled with blood which comes from a laceration in the lower part of the pons and through the floor of the upper half of the medulla.

Liver: Weight, 2,500 grams; size is increased; color is light yellow. There are extensive hemorrhages under the capsule and through the liver substance. Microscopically, numerous hemorrhages are seen in and about the portal spaces with extensive fibrin formation. The cells show marked cloudy swelling, fatty degeneration, autolysis and pigmentation. (Fig. 1.)

Kidneys: Very much enlarged, pale and congested. Microscopically, the epithelium of the cortical tubes shows extensive degeneration and disintegration.

CASE 4.—Eclampsia. Hemorrhage (Path. No. 634, 1906).

Patient.—Aged 28, iii.-para. Eighth month of gestation.

History.—She had had two previous normal pregnancies and labors. During the last previous pregnancy she had slight edema of the ankles. She enjoyed good health up to the time of attack, which came suddenly at 11 a. m. as a very severe headache. She felt fairly well during the afternoon. At 11 p. m. she had a general convulsion. She was brought to the hospital two hours later in coma, in which she died four hours after admission.

Autopsy.—Body shows edema, moderate in the body, marked in feet and legs. Subcutaneous hemorrhages over trunk and arms. No jaundice.

Brain: All ventricles are filled with blood which comes from a laceration in the left corpus striatum.

Liver: This organ is small, pale, yellow, very firm. There is extensive hemorrhage beneath the capsule and through the organ. Microscopically, extensive hemorrhages are found in and around the portal spaces. Some of the hemorrhages have destroyed as much as three lobules. The parenchyma shows cloudy swelling, slight fatty degeneration and pigmentation. (Fig. 1.)

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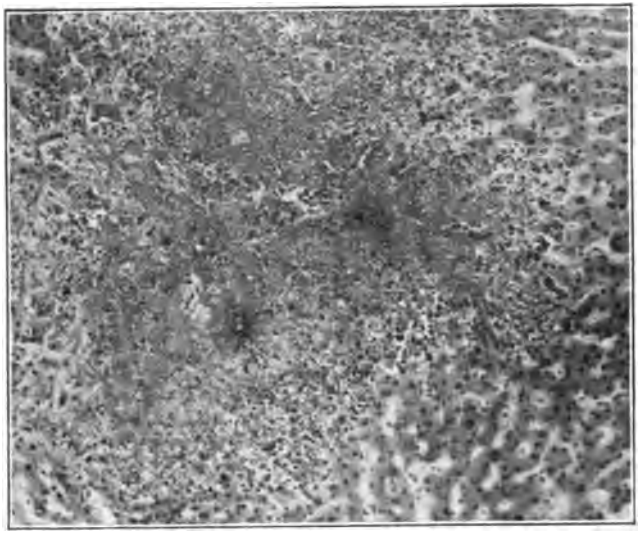

Fig. 1.—Hemorrhage in portal space.

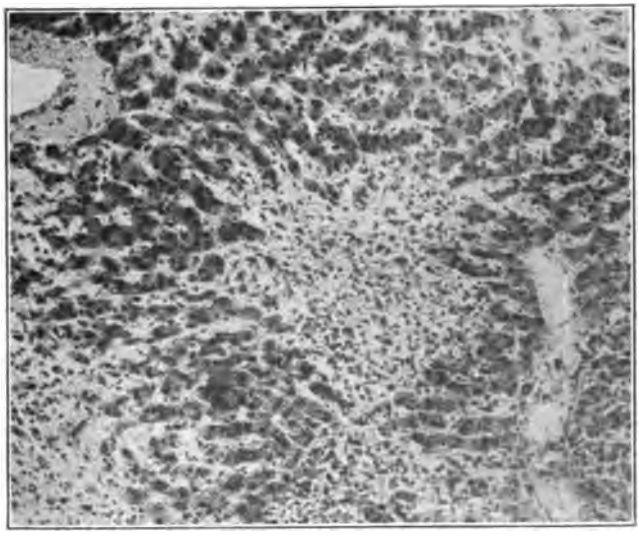

Fig. 2.—Central necrosis of liver lobule.

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Kidneys: These organs show extensive degeneration and sloughing of the epithelium in the tubules of the cortex. There are a few subcapsular hemorrhages over the lower part of the right.

CASE 9.—Toxemia of pregnancy. Hemorrhages (Path. No. 2098).

Patient.—Aged 30, iii.-para. Ninth month of gestation.

History.—Patient was brought to the hospital in the ambulance, having suffered from dizziness, headaches, swelling and pain in the legs for three weeks. After rest in bed and a limited diet the subjective symptoms disappeared, but the swelling of the legs persisted. She had a natural labor at 9 a. m. At 1 p. m., without having convulsions, she went into coma, which gradually deepened until 5:30 p. m., when she died.

Autopsy.—Body shows slight general edema. No jaundice.

Brain: The ventricles are all filled with fluid and clotted blood. The hemorrhage comes from a superficial laceration in the floor of the left lateral ventricle between the caudate nucleus and optic thalamus.

Liver: Slightly enlarged and light yellow. There are extensive hemorrhages beneath the capsule and through the organ. Microscopically, large hemorrhages are found in and about the portal spaces. There is very little coagulation of the blood in the hemorrhages. The liver cells in and about the hemorrhages show destruction from pressure, degeneration and necrosis. The general parenchyma is distorted and shows granular and fatty degeneration and pigmentation. About some of the hemorrhages are large accumulations of leucocytes. (Fig. 1.)

Kidneys: Are increased in size and congested. There is extensive degeneration and sloughing of the epithelium in the tubules of the cortex.

CASE 11.—Toxemia of pregnancy. Hemorrhages (Path. No. 425, 1909).

Patient.—Aged 30; iv.-para. Seven months pregnant. She was comatose when admitted; pupils were contracted; patient was generally cyanosed; there were no convulsions. Anterior lip of cervix was incised and the child delivered by internal podalic version. Patient died on day of operation.

Autopsy.—Body was not edematous. There is slight edema of the feet and legs. No jaundice.

Brain: The brain is symmetrical and well-developed. The convolutions are flattened. All the ventricles are filled with fluid blood. There is a hemorrhage in the pons which has ruptured through the floor of the upper half of the fourth ventricle.

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Liver: This organ is slightly increased in size and is pale grayish yellow in color. There is extensive hemorrhage beneath the capsule and through the liver substance. Microscopically, the liver cells show cloudy swelling, hydropic and fatty degeneration. There is a large amount of bile pigment scattered through the cells. Many of the portal spaces show extensive hemorrhage in and about them with extensive fibrin formation. (Fig. 1.)

Kidneys: These organs are much increased in size. The cortices are swollen and the capsules strip easily. Microscopically, the parenchyma shows albuminous degeneration and extensive sloughing. (Fig. 5.)

The diagnosis of eclampsia was made in two of these cases—Cases 3 and 4—because of the convulsions before death, and toxemia of pregnancy in the other two because of the absence of convulsions, yet the lesions in the brains and livers are very similar.

The accompanying table shows that the diagnosis of eclampsia was made in ten cases. In four of these, hemorrhages occurred in the portal spaces of the liver, in three central necrosis in the liver lobules, in one a general autolysis of the liver cells, and in two cloudy swelling only. The brain in one case showed congestion only, in two cases congestion and edema, in one edema and in two hemorrhages.

Four cases of this series were classified as toxemia of pregnancy. The livers in three of these cases showed the hemorrhagic changes above described; one showed necrosis about the centers of the liver lobules. The brain in one case showed congestion, and two showed hemorrhages. The kidney lesion in all these cases was very similar and consists in a parenchymatous nephritis with extensive sloughing of the epithelium.

In addition to the liver, brain and kidney lesions the greater number of the cases showed edema, fluid in one or more of the serous cavities, small hemorrhages in the serous and mucous membranes, especially in the pulmonary pleura, visceral pericardium and in the gastric mucosa. In some of the cases there were small hemorrhages into the lung parenchyma. The heart muscle

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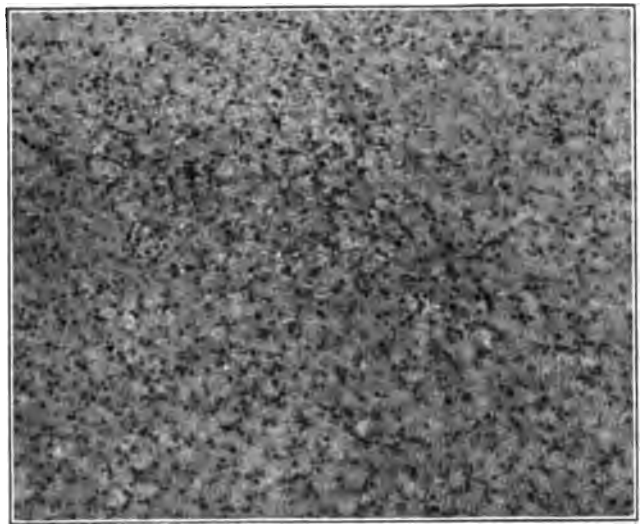

Fig. 3.—General autolysis of liver.

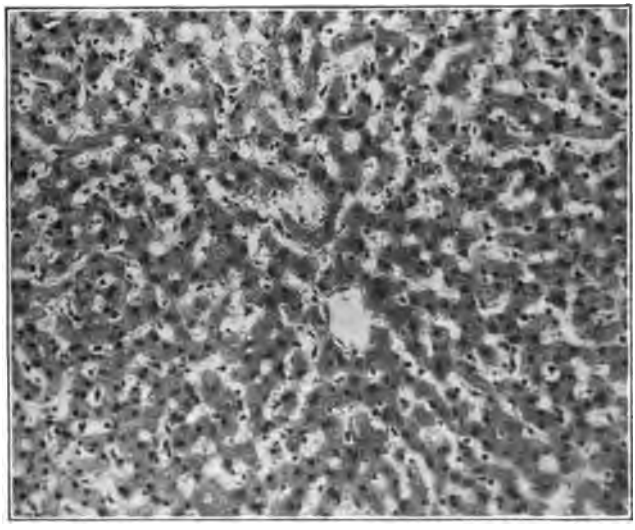

Fig. 4.—Cloudy swelling of liver.

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Case.	1	2	3	4	5	6	7	10	11	12	8	9	13	14
Diagnosis														
Eclampsia	x	x	x	x	x	x	x	x	x	x	..	..	..	..
Toxemia	..	..	..	..	..	..	..	..	..	..	x	x	x	x
Liver														
Hemorrhages	x	x	x	x	..	..	..	..	..	..	x	x	x	..
Central Necrosis	..	..	..	..	x	x	x	..	..	..	..	..	..	x
General Autolysis	..	..	..	..	..	..	..	x	..	..	..	..	..	..
Cloudy Swelling	..	..	..	..	..	..	..	..	x	x	..	..	..	..
Brain														
Congestion	x	x	..	..	..	..	x	..	..	..	x	..	..	..
Edema	..	x	..	..	..	..	x	..	..	x	..	..	..	..
Hemorrhage	..	..	x	x	..	..	..	..	..	..	..	x	x	..
Kidneys														
Parenchymatous Nephritis	x	x	x	x	x	x	x	x	x	x	x	x	x	x

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showed a slight clouding. One case exhibited subcutaneous hemorrhages and three jaundice.

It is the custom for many observers to classify eclampsia into a nephritic and a hepatic type, the former having edema in very pronounced form and the latter having jaundice present. In this series of fourteen cases only three of the patients had jaundice, and two of these had central necrosis in the liver lobules, and the third a slight cloudy swelling in the liver. Ten of the cases showing marked hemorrhagic liver changes showed no icterus. It would seem from these findings that the above classification is a very inaccurate one.

Turning to the etiology of the hemorrhages, we find them explained by the hyaline blood plate thrombi and emboli formed from cells from the liver and giant cells from the placenta. In these cases I have been unable to find the emboli of liver and placental cells, but thrombi are rather numerous, formed occasionally from blood plates, but more commonly from the fused stromas of red blood cells. It is the rule to find considerable hemolysis in the hemorrhagic cases. In some the effusions of serum in the serous cavities is deeply tinged with the diffused blood pigment. Hemolysis when occurring in the living body is usually preceded by an agglutination of the cells which undergo dissolution. It is these agglutinated cells that form the majority of the thrombi about which hemorrhages occur. Another factor in the production of the hemorrhages and probably the most important is a solution of the endothelial lining of the blood vessels. The agent causing hemolysis and cell destruction in the various organs destroys also the endothelium of the vessels, thus allowing an easy escape of the blood. Increase in blood pressure, which is usually heightened in this condition, increases the hemorrhage and gives the extensive lesions found in the brain and liver.

The nature of the agent causing such general cell destruction is not definitely known. Judging from the

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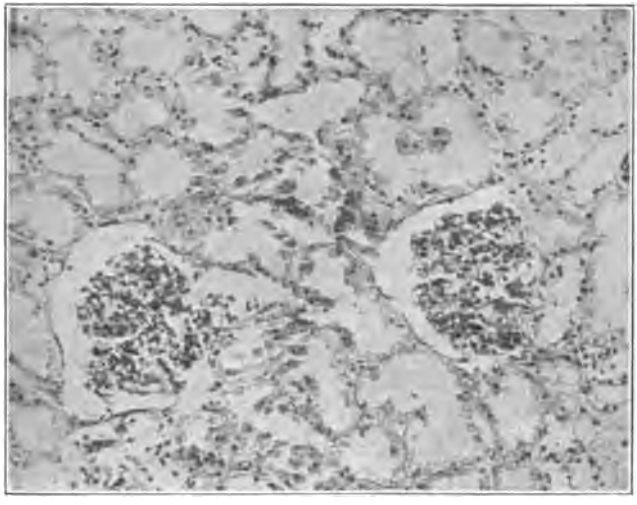

Fig. 5.—Type of parenchymatous nephritis found in all cases of eclampsia.

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histologic appearances of the cells affected it is probably an enzyme; but whether native in the cell with its function perverted to produce autolysis or whether introduced from a foreign source (placenta or fetus) is not determined.

The thyroid gland in these cases showed hypertrophy, and in one case considerable colloid cystic degeneration.

Studies of blood pressure in fifteen cases of eclampsia not included in this series showed a blood pressure ranging between 130 and 190. The pressure varied considerably at different times, and as a rule an increase was noted before and a decrease after the convulsive seizures.

The coagulation time was usually normal. In one case it was delayed ten minutes. No change from the normal was noted in the alkalinity. The specific gravity varied from 1035 to 1055, the lower figure was found in a patient having 52 per cent. hemoglobin. The red blood cells in these cases numbered 3,000,000 and under to each cubic millimeter of blood, except in one patient, who had 4,100,000.

The hemoglobin ranged between 52 and 60 per cent. One case showed 70 per cent. The leucocytes varied between 10,000 and 14,000. One case had 19,000. The polymorphonuclear forms varied from 79 to 81 per cent. except in one case in which there were 90 per cent.

The power of the serum of eclamptics and those suffering from toxemia of pregnancy to destroy the red cells of normal subjects was tested in fifteen cases. The serum was added to red cells of normal persons after washing the latter in 0.85 per cent. salt solution. It was found that some of the serum of each class would hemolyze normal red cells, while others would not. The cells of normal postpartum women were at first used. It was thought that pregnancy might possibly confer immunity against the action of the eclamptic hemolysin, and with this possibility in view normal male red cells were

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used. They were, however, found no more susceptible than the cells from postpartum women. The hemolytic power of the cerebrospinal fluid was also tested, but found invariably negative.

The urine of all the patients showed albumin, six had acetone and a marked excess of indican; two had diacetic acid and all showed casts.

The changes in the placenta when found consisted of hemorrhagic infarcts, degenerated epithelium and hyaline metamorphosis. Many placentæ show no change at all.

We are now in a position to explain some of the symptoms of these two conditions. The headaches are due to intracranial disturbance. The dura mater receives a nerve supply from the fifth cranial pair and is sensitive to cerebral changes, especially those that produce pressure. We have in these cases congestion, edema and hemorrhage which could act as irritants to the dura mater and produce the headache.

The visual disturbances, such as spots before the eyes, cloudy vision and complete blindness, are due to circulatory disturbance and edema about the base of the brain. The ophthalmoscope shows a pallor of the optic nerve, but as a rule no lesion even in the patients who have complete blindness and recover.

The petechiæ in the skin are produced by small hemorrhages from small vessels in which thrombi have formed, emboli lodged, or in which the endothelium has been destroyed. The nausea and vomiting may be due to one or a combination of causes which may be central or peripheral. The vomiting center may be impressed by poisonous substances circulating in the blood. The peripheral causes are reflex and may be due to the uterine enlargement, bowel disturbance, or to the irritation of the gastric mucosa by elimination of poisonous substances into the stomach.

Edema is produced by one or a combination of three conditions, which are: an alteration in the blood, an

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alteration in the vessel wall or a change in the blood pressure. In these cases there is anemia, destruction of the vascular endothelium and heightened blood pressure.

The jaundice is probably produced by cloudy swelling of the liver cells which compress the bile capillaries and increase the pressure of bile within them above that of the surrounding vessels and an overflow takes place into the blood and lymph capillaries through which the bile pigments are distributed to the tissues.

CONCLUSIONS

1. The liver lesions in eclampsia are not uniform. Pregnant or postpartum women dying from convulsions may have hemorrhages, central necrosis, general autolysis or cloudy swelling in the liver.

2. The liver lesions in toxemia of pregnancy are not uniform. They may be either hemorrhagic or central necroses, both of which are found in eclampsia.

3. The hemorrhagic lesions are produced by liver and placental cell emboli, thrombi formed from blood plates and fused red blood cells and by a solution of vascular endothelium. Heightened blood pressure increases the extent of the hemorrhages.

4. The agent producing the hemolysis and general cell destruction is probably an enzyme.

204 West Seventieth Street.

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A STUDY OF ECLAMPSIA

WITH THE RESULTS IN TWO HUNDRED AND FIFTY CASES, FROM THE WARDS OF THE LYING-IN HOSPITAL OF THE CITY OF NEW YORK

ROSS McPHERSON, M.D.
NEW YORK CITY

There is probably no obstetric complication about which more has been written and less really understood than the condition known as eclampsia. Not knowing its cause, we have been groping blindly in the dark to secure a satisfactory treatment, which, up to the present time, has been mostly empirical and anything but satisfactory in its results.

The mortality, both maternal and fetal, is appalling, and the multiplicity of treatments recommended by physicians give testimony to the worthlessness of these methods of procedure, as the large majority have been of necessity directed toward abating the symptoms and not to relieving the cause of the difficulty.

The uncertainty which we feel about eclampsia begins with its very name. In the latest edition of Webster's dictionary it is stated that eclampsia is derived from the Greek *"eclampain,"* meaning "to shine out," and is defined as "a fancied perception of flashes of light, or convulsions; the term is usually restricted to a convulsive affection occurring during the pregnant state and parturition." On the other hand, the author of one of the well known text-books on obstetrics states that the disease was so named on account of the suddenness of its onset, coming on like a flash.

Some observers discard the use of the word "eclampsia" altogether, asserting that, as the condition is a

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toxemia, which sometimes occurs without convulsions, in eclampsia without convulsions—if we use the term—we have the paradoxic condition of "convulsions without convulsions." Since we realize that several kinds of toxemia probably occur during the pregnant state, it seems preferable to me to consider eclampsia as a toxemia of the convulsive type, and the cases reported in this paper will be limited to those in which one or more convulsions were actually present.

Harrar,[1] in discussing eclampsia, states that beginning with February, the number of cases increases during March, reaches the highest point in April, and then steadily diminishes, finding the lowest level in November. The curve of this rise and fall nearly corresponds to the curve of the rainfall, which fact, he states, might explain the well-known theory that climatic conditions have something to do with the disease; although it is not clear why periods of unsettled weather should have the effect of producing a convulsive toxemia in pregnant women. It is an interesting observation, however, and in the series of cases here reported the greatest number occurred in February and March, and the least in December and January, which is approximately the same as above mentioned.

Regarding the frequency of the condition, the 250 cases occurred in 14,899 labors, which means 1 case to every 60 labors (1 to 60) or 1.7 per cent. of all labors. This is a high percentage and is due to the fact that a hospital is the clearing house for so many of the cases occurring in the city, and the probability is that it is about eighteen times as frequent in hospital as in private practice, the basis for this statement being that in our out-patient department, which represents private practice, in 46,252 cases, eclampsia was encountered 43 times; that is, 1 case in every 1,075 labors, or 0.09 per cent., as opposed to 1 case in every 60 labors in the wards of the hospital or 1.7 per cent.

1. Bull. of Lying-in Hospital of New York City, December, 1905, ii, No. 8, p. 72

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The condition is almost twice as common in primiparæ as in multiparæ, being 64.4 per cent. in the former and 35.6 per cent. in the latter, which proportion is more nearly equal, however, than the figures commonly given.

Multiple pregnancy is noted in this series in twelve cases, twins occurring eleven times and triplets once.

We divide eclampsia into three classes, according to whether it appears before, during or after labor; in other words, antepartum, intrapartum, and postpartum. The postpartum form is supposed to be the least common, according to the foreign observers, but in this country inspection of the literature shows that it apparently occupies second place in frequency of occurrence. In the series here reported, eclampsia was noted in the antepartum cases 140 times, or 56 per cent.; in the postpartum cases, 86 times, or 34.4 per cent., and in the intrapartum cases, 24 times, or 9.6 per cent., which agrees with the statement just made.

Regarding the age of the patients, the youngest noted was 15 and the oldest 48 years of age, the greatest number of cases occurring between the ages of 20 and 25, which is in accord with the fact that the greatest number of eclampsias occur in primiparæ.

In the natural order of discussion, in a general paper of this sort, the pathology of the condition should next be taken up, but as Dr. Welch's paper is devoted to pathology alone, and as his material was gathered largely from the cases comprising this series, and is so complete, I shall say nothing further regarding it, nor the symptoms, which are familiar to all, but after a few remarks on prognosis shall pass on to treatment.

The maternal mortality of eclampsia is given by various authors as ranging from 5 to 50 per cent. It also varies according as the treatment is expectant or immediately operative, and is, of course, much higher in hospitals than in the private practice of those who are skilled in handling the condition, as so many of the

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hospital patients reach the institution in a moribund state after delay and mishandling outside.

The fetal mortality is usually from 33 to 50 per cent.

In the cases here reported there were 77 maternal deaths and 110 still-born children, or those who died soon after birth, a mortality of 30.8 and 44 per cent., respectively, the latter fetal mortality being slightly below the average. Of the maternal deaths, 62.3 per cent. occurred in cases in which the eclamptic seizure took place antepartum; 31.1 per cent. in postpartum cases, and 7.7 per cent. in the intrapartum cases. On the other hand, contrasting these figures with those of our out-patient department, we find that of the 43 eclampsias there occurring, and already referred to, 10 of the patients died, a mortality of only 23 per cent., and this I must ask you to remember took place in tenement houses of the lowest type, surrounded by the most unfavorable conditions.

The treatment must be divided into (a) prophylactic and (b) curative, according to whether the patient shows symptoms of an impending attack or whether the convulsions have actually occurred, for the two conditions differ widely and yet are often treated in the same manner; we are continually seeing cases in which the proper treatment given at the right time would undoubtedly have resulted in the mother's recovery. Given a case in which headaches, dizziness, edema, and faulty elimination are present, even though no convulsions have occurred, and the patient is perfectly conscious and about the house, it is our duty to be on guard, ready to interfere promptly if the convulsive seizures supervene. Most certainly we should take all possible means to aid elimination by the various channels, in order to lighten the burden of the already overloaded organs; but if the case is growing progressively worse, and even one convulsion occurs, let us not lessen the chances for the patient by hesitating any greater length of time than is necessary to remove the cause of the difficulty, namely,

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the products of conception. While it is true that we do not know the exact cause of eclampsia, it is certain that the condition occurs only in the pregnant or recently pregnant state, and that every convulsion tremendously lessens the patient's chances of recovery, as the convulsions do not occur until the changes in the metabolism have gone so far that the balance between absorption and elimination has markedly increased in favor of the absorption, the eliminative organs are overpowered, and the chances for recovery decrease almost momentarily.

In a paper entitled "A Plea for the Prompt Evacuation of the Uterus in the Treatment of Eclampsia," by Fry,[2] read before this Section in Chicago, last June, a conclusive argument is presented for early delivery, and with this view I am in hearty accord. No statistics have been adduced to show that expectant treatment is of avail, and all of us have many times seen cases in which a prompt and early interference would undoubtedly have saved the woman's life.

When a convulsion occurs, then, let us empty the uterus, without delay. The means by which this shall be done will vary somewhat with the experience and preference of the operator.

In this series delivery was accomplished, by manual dilatation and internal podalic version in 89 cases, by forceps—high and low—in 49 cases, by craniotomy in 14 cases, by abdominal Cesarean section in 10 cases, and by vaginal Cesarean section in 2 cases. Induction of labor by means of the bags of Champetier de Ribes was performed 7 times. The maternal mortality following version was 38.5 per cent.; forceps deliveries, 20.5 per cent.; induction of labor, 42.8 per cent.; craniotomy, 28.5 per cent., and Cesarean section, 40 per cent.

The fetal mortality in the operative cases after internal podalic version was 62.9 per cent.; after high forceps, 44.4 per cent.; after induction of labor, 28.5 per

2. The Journal A. M. A., Dec. 12, 1908, li, 2041.

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cent.; after abdominal Cesarean section, none at all, or 100 per cent. of living children.

These are the statistics of the 250 cases. I will not attempt a comparison of these figures, which are approximately the same as those of other authors. I wish to reiterate, however, that these high mortality figures are not entirely due to eclampsia, but rather to the delay in sending the cases to the hospital where proper treatment could be instituted, thus losing valuable time.

Concerning the actual operative procedures for delivery, I shall say nothing except in regard to Cesarean section, both abdominal and vaginal. Of the abdominal sections here reported, 8 were done for contracted pelvis in patients in whom the eclampsia was an incident; 2 were done in moribund patients for the purpose of saving the child. As I stated in a paper on Cesarean section, read in this Section last year, I believe that there are cases, such, for example, as that of an elderly primipara with a small, narrow vagina, and a long cervix with a tough unyielding os, in which a rapid Cesarean section is the operation of choice, and during the past year I have found no reason to change my opinion.

I desire to utter a word or two of caution in regard to the employment of vaginal Cesarean section; it is an operation which requires considerable technical skill, and, while it has a distinct place in obstetric surgery, the wholesale use of it which is being recommended at present is, in my opinion, entirely unwarrantable. Any operation which offers the risks of puncturing the bladder and rectum—and I have seen this done by competent operators—the dangers of hemorrhage and the difficulties of suture which this one does, is not lightly to be undertaken, except in the hands of an experienced vaginal operator, under exceptional circumstances, and even he may at times meet with great difficulties in securing a satisfactory outcome to his case.

Finally, when the patient is delivered, the uterus emptied, and convulsions then either continue or come

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on, this is the time when efforts should be directed first toward controlling the convulsions, in order that the patient may not do herself bodily injury, and, second, toward securing elimination by the various excretory channels of the body.

To control convulsions, for a long time chloroform has been used most generally. In addition to this, bromids and chloral by rectum, morphin and other hypnotics have been tried. For the past few years, however, I have been using scopolamin hydrobromate, gr. 1/100, in combination with morphin sulphate, gr. 1/6, and have been highly pleased with the results, which have been most satisfactory. One or two doses generally suffice, and the amount of morphin given is not sufficient to lock up the bowels, which is the objection usually lodged against it. It is to be remembered, however, that the changes in the organs have here advanced so far that they are not doing their excretory work properly, and so the main attention should be turned toward elimination. This is accomplished by rectal irrigations of normal saline solution in large quantities, by bleeding followed by intravenous infusions of normal salt solution, hot packs and as free catharsis as possible. Thyroid extract has been tried with apparent promise, and in some parts of the country veratrum viride is still high in favor.

In closing, allow me to emphasize that—until we have a more tangible knowledge of the actual cause of these toxemic convulsions—the only feasible treatment for the condition of eclampsia is immediate evacuation of the uterine contents, *followed* by proper eliminative care in the puerperium.

37 Madison Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. WELCH AND M'PHERSON

Dr. Horace G. Wetherill, Denver: I read a paper on a subject allied to this at the Chicago Session last year. I saw in the pathologic collection the livers and brains from the cases reported by Dr. Welch, and they are characteristic of similar cases which I have seen. There are one or two

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points in which my judgment would not confirm the statements made in the papers, particularly in the paper of Dr. Welch. He says that usually the ophthalmoscope shows very little. In the cases I have had an opportunity to observe the ophthalmoscope has been of the greatest possible assistance. Early in the disease, and before many of the general symptoms were developed, there were very definite changes in the eye-grounds in the form of a neuroretinitis or even small retinal hemorrhages, and I have learned to think that the oculist may be of great service in making early diagnoses in these cases. I can not agree either with the statement made with reference to the use of chloroform. We know that the cases of late chloroform poisoning present pathologic changes closely allied to those which Dr. Welch has shown us in drawings, and in my opinion it is not at all safe or wise to give chloroform to patients under these circumstances. That is a point which I tried to make clear in my paper last year, and which my previous observation and subsequent experience lead me to believe is a very important one.

Dr. F. Lawrence, Columbus: I wish to report briefly two recent observations, for what they may be worth in the matter of etiology or causation, and possibly for the help they may give in future observations. One patient was a young woman, a primipara, under the care of an excellent physician. There was marked anemia, on account of which a blood-count was made by a pathologist. The hemoglobin test revealed between 30 and 40, about 2,000,000 and a fraction under 3,000,000 reds, with approximately a normal count of about 4,500 white corpuscles. There was at the first observation very little albumin, but in the course of perhaps ten days there was a further marked diminution in hemoglobin and in the red blood-count, with approximately a level white blood-count. The albumin markedly increased and the woman died in an eclamptic seizure. The other patient was a young woman who a year before aborted with twins at about the fifth month. She had a marked amount of albumin and was anemic. She was taken to the hospital, where the blood-count showed 2,100,000 reds, 4,200 whites and 31 hemoglobin. She was placed under the charge of my colleague, Dr. Whitaker, and he treated her by the usual remedies and by forced feeding to increase the blood count and the hemoglobin, but without effect. She was near term, and was delivered naturally and without convulsions. About twenty-two hours afterward she died like a flash. She had a marked amount of albumin. The question in my mind is, how much can we do by more careful blood observation to prevent these unfortunate deaths? How much can we do by educating not only the physician, but the patient that the woman who is to become a mother should have all the careful observation in the early stages of pregnancy that is given in any other crisis of life?

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It seems to me that we should accomplish something in this matter by an exhaustive study of the blood conditions.

Dr. C. C. Frederick, Buffalo: I wish to relate an experience that I recently had which might possibly be of interest. In January or February I read a paper in Detroit before the Wayne County Medical Society. At a little informal gathering after the meeting the subject of tetanus came up for discussion, and Dr. Hutchins of Detroit spoke of the control of the convulsions of tetanus by the administration of "chloretone," and told me that he had succeeded in controlling convulsions in five cases of tetanus out of six through to recovery. This is an unusual percentage, and he ascribed his success largely to the chloretone as an antispasmodic. It occurred to me that possibly this drug might be of benefit in puerperal eclampsia because if the eclamptic seizures in the ordinary run of cases can be controlled by any means whatsoever, without detriment to the patient, the patient may be carried along until by elimination the toxemia is got rid of and the convulsions cease. I agree with those who oppose the use of chloroform because, as stated, we know that the late poisonous effects of chloroform are very similar to the results of toxemia. I have seen two cases in consultation, in both of which I advised the use of chloretone as an antispasmodic, and I was much pleased with the effects. It is given by rectum if the patient is unable to swallow. If the patient can swallow, 10 or 15 grains are administered in water. I carried both these patients along with the chloretone for twenty-four and thirty-six hours, respectively, until they were rid of the toxemia.

Dr. C. S. Bacon, Chicago: I wish to call attention particularly to the nature of the disease that precedes the convulsions. It seems to me that it is an advantage for us to look on eclamptogenic disease, the pre-eclamptic stage, as a disease. one symptom of which is convulsions. Looking on it in this way we regard the convulsions simply as the crisis, as we regard infantile convulsions as the crisis of an intestinal infection. The question is then the study of this eclamptogenic disease and here, of course, the pathology as discussed in the paper of Dr. Welch is of the utmost importance. But the question of diagnosis before the convulsion occurs is also of importance. We have all had the experience that the study of the urine fails us. Sometimes convulsions occur when there has been no albumin up to within a few hours of the convulsions. The eye symptoms fail. Other symptoms fail. I have long regarded general edema as one of the most important of the symptoms of this disease. In the last two years I have begun to make regular investigations of the blood-pressure in all patients, and so far my experience leads me to think that the systematic study of the blood-pressure is one of the best means at our command. I have not yet seen any convulsions in cases in which the blood-pressure is not above 160.

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In most instances, as recorded by the ordinary instruments, the pressure has been in the neighborhood of 180 or above. I believe, therefore, this is a very important point in the diagnosis and the prognosis of the disease. It is also of great value in the diagnosis of eclampsia. I have had two cases this year in which the convulsions were diagnosed as eclamptic, but were shown afterward not to be eclamptic. One patient was hysterical, the other was an old epileptic. In both cases eclampsia was doubted because of the low blood-pressure. In general, this would perhaps be of great value in enabling us early to determine this disease and prevent the climax. We know that the results of treatment are very unsatisfactory. The result given by Dr. Welch shows 30 per cent. of maternal deaths. Everything points to the necessity for increased knowledge of the disease and our hope is in a future determination of its character.

This, however, does not carry us very far along toward treatment. Everything that we can do to prevent the occurrence of convulsions we should do. Interference with the high blood-pressure is of value. The induction of labor I believe is of the utmost importance. Up to the last year I have been favorable to the vaginal Cesarean section, but one or two bad experiences of my own, and others reported by other operators in my own town have led me to the same conclusion as that expressed by Dr. McPherson, namely, that the method is dangerous. Undoubtedly the dilatation of the cervix in proper cases is the correct method to pursue with delivery by forceps or otherwise if the cervix is thoroughly dilated but in a rigid cervix the abdominal section is quicker and safer than the vaginal.

Dr. Henry D. Fry, Washington, D. C.: I am gratified to find that Dr. McPherson bears out the line of treatment that I suggested in the paper I read last year before this Section in Chicago. I think that the only way to treat eclampsia until we know something about the cause of it is to treat it in the same way that we treat placenta prævia. In some cases there is a dangerous condition, the result of the fetus in the uterus, the mother is liable to die of hemorrhage, and the only safety to the woman is to empty the uterus at once. In other cases there is a toxemic condition coming on and if we delay by using any treatment other than immediate evacuation of the uterus we are losing valuable time. I am sorry to have Dr. Fredericks recommend chloretone. It may be a good thing, but we have done too much in this line of trying to hold back the convulsions by the use of antispasmodics. The only good statistics to be found to-day of the treatment of eclampsia, the only ones giving a mortality under 10 per cent. are those given as a result of emptying the uterus at once, and no other. If the obstetrician dilly dallies, treats with diaphoretics, etc., to control the convulsions, he is losing valuable time. Dr. McPherson showed that the mortality is highest in the ante-

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partum cases. This is because of the delay; because the uterus is not emptied soon enough. The statistics which he gives of the high death rate after the birth of the child is contrary to many of our text-books, which state that in the most favorable cases the mortality is only 7 per cent. I believe the mortality is higher and that the reason that these women who die in the post-partum stage do not die from the primary toxic condition but from a secondary condition, is a complication involving not only the mother's liver but the brain. The brain shows intracranial hemorrhage, and I think these women who die in what we call eclampsia postpartum, die of secondary conditions, the result of letting the convulsions continue too long. The indication is therefore to empty the uterus at once. The text-books are very conservative on eclampsia. They first state what to do to eliminate the poison; next, to control the convulsions, and last, they tell about the obstetric treatment, but they do not urge the quick and prompt evacuation of the uterus.

If that is the line of treatment the next question is how best to empty the uterus. In cases in which labor has advanced and the cervix is dilated, it is easy to apply forceps after rupturing the membranes. The larger number of cases of eclampsia we have and the worst cases are those in primiparæ, in whom there is an intact cervix, rigid and undilated, and in whom labor has probably not begun. Such a uterus can not be emptied quickly by manual dilatation, by the rubber bag, or by the Bossi dilator. Either abdominal or vaginal Cesarean section must be done. The maternal mortality in abdominal Cesarean section is high; the fetal mortality low. I want to say something in favor of vaginal Cesarean section. The operation is not popular. At the session in Chicago Dr. Carstens, in discussing my paper, said that vaginal Cesarean section was such a simple thing that every general practitioner ought to be prepared to do it. I disagreed with him and agree with what has been said to-day, that the operation should be done only by a man who does vaginal surgery; and, done by such men I think it is the most valuable obstetric practice in eclampsia in primiparæ.

Dr. C. C. Frederick, Buffalo: I do not think that Dr. Fry had any right to assume that I believe in sacrificing any patient with puerperal eclampsia simply because I recommended the use of chloretone. I feel sure that Dr. Fry would do anything to control the convulsions while he was getting the baby out of the uterus. Chloretone will do that. I take the baby out just as quickly as I can, but I believe in the use of chloretone to control the seizures.

Dr. Reuben Peterson, Ann Arbor, Mich.: I am glad to hear Dr. Fry approve of vaginal Cesarean section. I am a believer in the operation, but I disagree with him in regard to the use of this operation by the general practitioner. It is

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not an especially easy operation, but what under certain conditions is the practitioner going to do? When he encounters one of these cases out in the country he can not send ten, fifteen or twenty miles for a specialist. If he could do that it would be all right, but he has to meet the emergency as he finds it, and how shall he do this? Take the kind of patient Dr. Fry is speaking of, a primipara with rigid cervix. We all know what dilatation of the cervix under these conditions means. The practitioner begins before breakfast, goes home to lunch, returns and continues the dilatation, and then finally, after having infected his patient, delivers her. Given such a condition, what operation will do the least damage? I maintain that the general practitioner under such conditions will do the least damage by doing a vaginal Cesarean section rather than manual dilatation. The only other operation is dilatation with the Bossi instrument, the use of which will do far more damage than the vaginal Cesarean section. The latter operation is one which the general practitioner need not hesitate to perform, for the life of the woman depends on emptying the uterus quickly and I firmly believe that that is the proper treatment in eclampsia. He makes an incision anteriorly or posteriorly, as the case may be. He pushes up the bladder, splits the cervix and delivers by version. Vaginal Cesarean section is a much simpler operation than high-forceps delivery, yet the high-forceps operation is thought perfectly proper for the general practitioner to do. In our schools the students are taught to do this dangerous operation, and yet when it comes to a much simpler operation, splitting the cervix from below, the practitioner is told that he should not do it. I am not a believer in indiscriminate operating by the general practitioner, but when the emergency arises and he has to empty the uterus, he will do this with better results by the vaginal Cesarean section than by manual dilatation.

Dr. J. E. Welch, New York: In the diagnosis of eclampsia by examination with the ophthalmoscope, the examinations were made in a number of cases, not by me or any one inexperienced in the use of the ophthalmoscope, but by no less an authority than Dr. Arnold Knapp. I have his word for these changes. Of course pregnant women dying of convulsions may have hemorrhages in the background of the eye. These patients may be suffering from nephritis as a primary disease in which hemorrhages are not uncommon. It is possible for the convulsions to be produced by other conditions than those which cause the liver changes mentioned. As to bacteria being the cause of eclampsia I can say, after making many blood cultures, that I have never found it so.

I did not mean to give the impression that autolysis occurred in one case only. In the section marked autolysis, the cells are very much enlarged and retain their outline, but the protoplasm appears to have been dissolved. One liver showed

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this condition throughout and it can be found in nearly all the cases in isolated cells. Women dying of convulsions often do not show these advanced liver changes, and again others dying without convulsions may show them; from which we may assume that the convulsions are not always produced by the liver lesions.

The urine has been responsible for induction of many labors. At first it was albumin which was responsible for the induced labor, then urea. Many a man has terminated pregnancy because of a low urea percentage. Then the nitrogen and the high ammonia content came in for attention. These changes only indicate a disturbed metabolism and are found in conditions other than pregnancy, and from which recovery often takes place. No one of these things can be depended on as an absolute criterion. The finding of leucin and tyrosin is most unsatisfactory. Their presence cannot be determined by the microscope, for crystals resembling them often, when submitted to some more ultimate test, prove to be a different composition. The blood pressure in these cases is usually high. Some patients will have convulsions when the pressure is below 160. We are now familiar with the pathology of eclampsia from the standpoint of morphology, but we are in need of some certain means of diagnosis to determine which patients are in danger and which not.

The obstetrician should be one of the broadest men in the profession of medicine and able to study his case from all possible standpoints. Usually it is the young man recently out of college to whom the older practitioner turns his obstetric cases. The greatest evil comes through the midwife who is untrained and cannot recognize the danger signals in this condition. This Section of the American Medical Association ought to take some action toward limiting the practice of midwives. In these cases the lives of two persons are endangered, and since we find no one pathologic condition that will tell us which is the dangerous case and which is not, the obstetrician should be thoroughly trained in the interpretation of clinical signs both by the bedside and through the laboratory.

Dr. Ross McPherson, New York City: I think I stated in my paper that chloroform was used. Dr. Wetherill thought I advocated the use of it. It was because I objected to its use that I tried to get something else and began the use of scopolamin in the doses of which I spoke. I do not think scopolamin can be trifled with indiscriminately, and I am inclined to think that the dangers of chloroform are over-rated, because there is so much of it used without any apparent trouble. However, the lesions that one does find posmortem, agree with the excessive use of chloroform. I do not agree with Dr. Wetherill that edema is an extremely important symptom. I see many patients with an excessive amount of edema who do not have eclampsia and who recover without trouble. I admit that it is distressing to have a patient who is absolutely water-logged.

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I have had one or two recently who have had quite as much edema as any patients I have ever seen, with absolutely no other symptoms at all.

Regarding vaginal Cesarean section, Dr. Peterson sums up the matter very well in saying that if the obstetrician knows the technic it is not a difficult operation. But the trouble is that the general practitioner does not know the technic and has not the opportunity to get the experience. It is very simple to say, make an anterior incision in the cervix and a transverse incision in the vaginal vault and push the bladder out of the way; if not enough room, then make a posterior incision, go in and push the rectum out of the way, but it is difficult to do it. Furthermore, these patients have a way of bleeding quite extensively. I think the operation has a distinct time and place, but that the indiscriminate use of it is an extremely hazardous thing.

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FINAL RESULTS IN CONSERVATIVE SURGERY ON THE OVARIES

JOHN OSBORN POLAK, M.Sc., M.D.
BROOKLYN

The meagerness of the literature on conservative surgery on the ovaries, when these organs are the seat of neoplastic formations, has prompted me to analyze the cases in which I have performed operations in the last nine years, and of which detailed records, noting the pelvic conditions and symptoms at the end of one and two years, have been kept.

Do the remote results of conservative surgery on a diseased ovary warrant us in resecting such an organ? This is the question which the surgeon must answer daily, at the operating table. On the one hand, ablation in a young woman has many unfortunate physical and psychical results; while the preservation of a part of one or both ovaries renders the symptomatic cure of the patient uncertain, and a secondary operation may be necessary.

The reasons which have been advanced in favor of conservatism are, first, the preservation of the ovarian function (i. e., that of ovulation and possible pregnancy, and the retention and maintenance within the body of the ovarian secretion); second, the avoidance of the artificially produced menopause, with its troublesome nervous phenomena. Many patients, for sentimental reasons, refuse operative relief, because an oöphorectomy must be done to get it.

Are the first two reasons of sufficient importance to compensate the woman for the frequent recurrence of

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her pain, and the ever-present possibility of further cystic changes, and the necessity of subsequent operation? In 1903 the late Palmer Dudley presented a paper before this Section, based on a study of 269 cases of his own (in which the left ovary had been resected in 130 cases, while the right had required resection in 141), together with the 2,212 cases of other operators, reported to him in personal communications.

In this paper he concludes that conservatism is justifiable, because it maintains and retains the menstrual function. No mention, however, is made of the exact pathologic condition of the ovary which required the resection. Neither is there any mention of the final results of the operation.

In a study of 1,970 cases of resected ovaries, abstracted from the literature, I find records of but thirty-two known pregnancies. Hyde, in concluding his admirable and scholarly paper on this subject, says: "Pregnancy does not occur as often as thought; in fact, it occurs in not more than 5 per cent. of the patients operated on in this way." Again, all resected ovaries present the possibility of a recurrence. Hyde's incomplete records show that about 5 per cent. of the patients return for subsequent operation. The avoidance of the artificially produced menopause is the only result that resection can absolutely promise. Some years ago, in a paper read before the Brooklyn Gynecological Society, in which I reported 161 conservative operations, I called attention to the disappointing symptomatic results of ovarian resection, and I believed then, as I do now, that the field of ovarian resection is a very limited one. There are ideal and selected cases, in which conservatism may be practiced.

A study of the records of 300 cases, occurring in my personal service, in which resection was done, with the large number of secondary operations necessitated, has afforded me a wider insight into the pathologic conditions which follow on resection, and thus permits me

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to make some practical deductions. This series shows that forty-one patients have returned for further operation; or over 12 per cent. of the entire number operated on by conservative methods since 1901 have required ablation of the remaining ovary, or the part of the resected ovary left at the primary operation.

Twenty-six pregnancies have occurred in the 240 women who could have become pregnant, or in over 10 per cent. of the women operated on, which is a higher percentage of pregnancies than generally reported. One patient contributed three full-term pregnancies and two abortions to this list.

This fertile patient, though included in a previous paper read before the Brooklyn Gynecological Society six years ago, is entitled to further mention, as she exemplifies a type in which conservatism may be used with some certainty of success. I refer to the ovary which is the seat of a monolocular-cyst. This patient was 18 years of age at the time of her primary operation, and had suffered since puberty from premenstrual and menstrual dysmenorrhea. Both ovaries were cystic and prolapsed; the left, on section, showed numberless small cysts throughout, and was removed. The right contained one large cyst the size of a lemon, destroying the entire cortex. This was resected by a wedge-shaped excision, leaving only a fringe of the hilum, .5 cm. wide and 2 cm. long. Both tubes were left undisturbed. This patient has been attended by me in all her pregnancies. She has menstruated regularly and, while there is no enlargement of this remnant of ovary, it is tender and causes some premenstrual pain at this period. During the past year the catamenial flow has become scantier, and the patient is beginning to complain of the nervous phenomena which suggests an approaching menopause.

In all the patients (except the forty-one returning for reoperation) an early operative menopause has been averted, and 106, or more than one-third of the total number, are free from pelvic pain of any kind, menstrual

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or intermenstrual. These patients have been carefully examined repeatedly, and their pelvic findings recorded. In twelve of this number the "treated" ovary is larger than one would suppose it should be, but has occasioned no contiguous inflammation and has produced no symptoms.

In eighty-one women both ovaries were resected by the excision of a wedge-shaped piece of ovarian tissue, which included the diseased structures. The ovarian wound was then closed with a fine catgut suture, great care being taken to have all hemorrhage controlled and dead space obliterated, with just sufficient tension to obtain coaptation without constriction, which I believe to be the cause of many failures. This was illustrated at the secondary operation in two instances, which will be cited later.

In 219 of the women making the basis of this report one ovary was entirely removed and the other resected after the method described above. It is interesting to note that seventeen of the twenty-six pregnancies recorded followed ablation of one ovary, while the ovary producing the fertile ovum had been extensively resected. Further, so far as my pathologic records can be followed, but two patients who were fortunate enough to become pregnant presented microcystic ovaries at the time of operation. This bears out a contention which I have made on previous occasions, and concurs with Hyde's views, i. e., that a microcystic ovary, sufficiently diseased to cause pain or invalidism, is better removed, as conservatism in this class, as Gordon wisely states, consists in "conserving the woman's health, not in preserving a diseased organ."

The results of attempting to preserve a diseased ovary when it is the seat of multiple microcystic degeneration are illustrated by the following case, which may well stand for a type:

A. H., aged 23, admitted to my service in the Jewish Hospital, married, sterile, had always suffered from severe pre-

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menstrual dysmenorrhea, which had become worse since her marriage. She also complained of a profuse mucopurulent leucorrhea. The smear from the cervix showed gonococci. A median abdominal incision disclosed a double hydrosalpinx, with a cyst of the left ovary totally destroying the organ. Both tubes and the left ovary were removed. The right ovary presented a multiple cystic degeneration, the cysts varying in size from that of a pea to that of a bantam's egg. The cystic portion was freely excised, leaving only a narrow strip of the ovarian hilum, apparently free from any cysts. Post-operative recovery was uncomplicated. On examination one year later, the patient stated that her menses had recurred regularly, lasting two days, but of small quantity, preceded by severe pain in the right side and swelling of the breasts for two weeks before each period, and that all marital relations had occasioned severe pain. On bimanual examination, the uterus was found in normal position, with its mobility limited on the right side and posteriorly. The right ovary was the size of an orange, painful and adherent.

Of the forty-one patients who have returned for further surgery on their adnexa, all but three present similar histories and findings. All resected ovaries swell and become markedly enlarged during the first month after operation, but this swelling gradually subsides under the influence of time, rest, and the establishment of an equalized circulation. This latter can be obtained only by careful suturing of the ovarian wound without constricting it, and by placing the resected ovary high in the pelvis, in order that the return circulation may be favored, and further, that it may be free from peritoneal contact until such time as its wound is closed over, for peritoneal adhesions make painful ovaries.

If the return circulation is impeded by the misplacement of sutures, the cystic formation is very rapid and extensive, as was instanced in two of my reoperations, which were done within two weeks of the primary section, and in which the remaining ovary was found in the cul-de-sac, markedly cystic and adherent.

The primary section in one case had been made by one of my assistants. Both tubes had been removed by a running suture along the top of the broad ligament,

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and the right ovary resected by a wedge excision of several cysts. The bleeding was troublesome, and in attempting to control it the circulation was interfered with by the too frequent insertion and too tight application of sutures. The ovarian engorgement was further increased by the omission on the part of the operator to suspend the uterus in order to keep the resected ovary high in the pelvis. Too much can not be said on this point; the ablation of the tubes, with or without the removal of the ovary, will always shorten the broad ligaments, and so pull the uterus out of and back of its normal position; or when one ovary and tube are removed, the uterus will be drawn backward and to one side, unless counterbalanced by some procedure which will hold the uterus in place.

On examination of these patients before dismissal from the hospital I noted the uterus displaced backward and to the right, and a large cystic mass the size of an orange in the right posterior cul-de-sac. On reopening the abdomen, it was seen that the sigmoid had become adherent to the anterior face of the fundus, and that the uterus was retroverted over a large cyst of the right ovary, densely adherent by fresh adhesions in the cul-de-sac. The size of the cyst surprised me.

The findings in the second patient were almost identical with those just described; the adhesions were freed and the ovary removed. Before closing the abdomen the uterus was suspended; the subsequent recoveries were uneventful. I am convinced, from my secondary operation findings, that many recurrences of cysts or of pain about the tumor (or on the other side after one ovary has been ablated) are due to omission to secure the resected ovary high enough in the pelvis to maintain an equalized blood supply, and to failure to keep the wound surface free from omental parietal and intestinal adhesions, which may be accomplished if the uterus is raised by some of the many retroversion operations. Even when a uterus is in normal position before opera-

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tion, removal of part of the adnexa will shorten the broad ligaments, and will retrovert it to some degree, enough to start the vicious cycle. Both tubes were removed in sixty cases in the course of this series. When a double salpingectomy is made, it is my custom to suspend the uterus, no matter what its previous position may have been. This step, I believe, does two things: it minimizes the adhesions of the omentum and the intestines to the stump, by encouraging adhesion to the parietal peritoneum; and it maintains the ovary in a better position for its circulation.

All of these operations were in child-bearing women. In 119, but one tube was ablated; and both tubes were left undisturbed in 121, leaving 140 women in whom future pregnancy was a possibility. The tubes were ablated; the uterine portion of the tube was excised by an elliptic incision about the tube into the cornua, exsecting most of the intramuscular portion; and the free portion was cut away. The muscular gap thus produced was closed with interrupted catgut sutures, and hemorrhage from the ligament controlled with a running suture along the top of the broad ligament, which technic, I believe, helps to retain the length of the broad ligament.

Notwithstanding this careful technic, one patient became pregnant in the cornua of the uterus, and developed an interstitial pregnancy, which has been reported elsewhere. This case has not been included in the report of the pregnancies following on resection of the ovary, as it occurred in one of the sixty patients in whom both tubes had been excised.

No attempt was made to preserve any portion of a diseased tube by resection or the phimosis operation. When a tube was found diseased it was removed, as my former experience with conservative procedures on the tubes has been most disappointing.

A study of the class of ovaries resected will perhaps lead to conclusions of value. In 163 cases pathologists'

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reports are noted. Of this number, ten patients had simple retention cysts, due to thickening of the wall of the capsule, resulting from long prolapse of the ovary. Of these, three were treated by simple puncture with the cautery, with the following end-results: One is cured of all pelvic trouble. Two have tender and enlarged ovaries, though one of these women has been pregnant. In the remaining seven cases, the ovaries were resected and the patients made perfect recoveries. Six patients had dermoids; the tumor was excised, and the remaining stump of the hilum preserved by careful suturing. One of these women has returned for reoperation for a unilocular cyst, developing from the retained fragment.

In case of papilloma, unrecognized clinically at the time of operation two years ago, a papilloma of the resected ovary subsequently developed, with papillomatous peritonitis-ascites and hydrothorax. The patient was operated on again and has made a good primary recovery. Seven large multilocular cysts, varying in size from that of an orange to that of a child's head have been enucleated from their laminated walls, which were trimmed down and sewed over, leaving a resected portion of an ovary 3 to 4 cm. long and 1 cm. wide. No recurrence has taken place; the ovary has atrophied, menstruation has continued normally, and one pregnancy has resulted.

Forty-seven patients had cysts of the corpora lutea, which had increased the weight of the ovary sufficiently to make it prolapse and to cause menstrual and intermenstrual symptoms; in all cases the ovaries were deeply resected by wedge-shaped excisions. Thirty-six patients are free from pain and menstruate regularly and painlessly. Four have required further surgery; two have a small, cirrhotic and painful ovary as a result. Five complain of menstrual pain without any physical change in the organ.

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Two primary fibromata of the ovary were enucleated from their capsules, the excess of which was cut away and sutured, so as to make a small mass of ovarian tissue. Both the patients have been lost track of. In the remaining ninety cases the diseased structures belong to the class of multiple cystic ovaries, presenting numberless small cysts throughout the ovarian structure. In fifty-five of these cases one ovary was ablated, leaving one good ovary, while thirty-five were resected.

The extent of the involvement in each ovary was determined at operation by an incision through the organ from cortex to hilum, laying it open for inspection; the entire cystic portion was excised, and the remaining fragment carefully sutured with fine catgut. But five complete cures are recorded, twenty-one patients have returned for further surgery. Nine menstruate regularly, though the quantity has become scantier each year, and each period is attended with some degree of menstrual pain.

Two pregnancies followed resection in this class. It would seem, therefore, that multiple cystic degeneration was least favorable to conservative procedures, while ovaries containing retention cysts, cysts of the corpora lutea, large monolocular cysts, fibroids and dermoids, may be conserved by resection, with considerable hope for the patients' continued well-being.

287 Clinton avenue.

ABSTRACT OF DISCUSSION

Dr. John G. Clark, Philadelphia: Several years ago, when the question of conservatism came prominently into the foreground, many of us felt extremely enthusiastic as to the outlook. We had all seen the disastrous effects of a surgical menopause on very young women, and yet ovariotomy was the common procedure in those patients suffering with suppurative conditions incident to the gonococci which commonly attack younger individuals. In some of these the surgical menopause was so infinitely worse, so far as its effect on the individual, than the original disease, that the second condition was far worse than the first. We looked, therefore, with happy anticipation to the elimination of the infection through salpingec-

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tomy and the conservation of the ovaries. Unfortunately, our hopes were not realized, for an operation in the midst of an acute gonorrheal infection is usually followed by most disagreeable sequelæ, such as progressive suppuration and, ultimately, a second operation or very serious invalidism. I have therefore been forced to the conclusion, as the result of practical observation of a large series of cases, that an operation in the midst of an acute inflammatory disease is more likely to be successful, so far as actual relief of symptoms is concerned, if radical rather than conservative. However, we have recently had brought before us, particularly by Simpson and others, the value of withholding operation until the acute process has passed and merely the pathologic débris remains. This recalls the classic observations of Saenger, than whom there was no greater or more acute observer, with reference to the residuum of disease. He particularly laid stress on the fact that the so-called chronic adherent ovaries and tubes were not the seat of infection, but were merely the derelicts of the gonococcal storm. In some instances, the destruction has been so extensive that nothing less than a radical operation will suffice; in others conservatism may play a splendid rôle. Conservatism as I view it at present, therefore, does not relate so much to the operation as it does to the time for the election of the operation. In all acute inflammatory conditions, unless symptoms are most threatening, I withhold operation until the acute inflammatory process has passed, and the patient is largely free from pelvic symptoms. Then one may perform the abdominal operation with the view to removing the residium of the inflammatory attack, leaving behind all structures which having been involved are now well, or which have not been invaded by the attack. In this way I have secured results which are infinitely better than those which followed operation in the midst of acute infection.

Dr. Polak has, I believe, put before us another phase of this question, namely, that pregnancy, which was formerly a chief mainspring in considering conservatism, need no longer be considered, for the majority of women who have suffered from inflammatory diseases had been and will still remain sterile. The conservation of ovarian tissue is done with the sole purpose of perpetuating menstruation and preserving that occult influence which is ascribed to the ovarian secretion. This is of the greatest value, not only from merely the sentimental, but also from the physiologic standpoint. Every woman under these conditions may hope for maternity, whereas with the complete cessation of the period this hope is lost and she is very likely to become morbidly introspective and chronically neurotic.

Dr. Howard A. Kelly, Baltimore: This subject has been a burning question with us for many years, and it is interesting to note how our attitude relative to a particular question will

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change in the course of years. By conservatism now we mean diseased ovaries, and yet I doubt a little whether Dr. Polak does not include cases which we do not consider diseased at all; those cases of small cystic formation. My experience in the past twenty years has been that conservatism has a more and more limited field. We all went at it as Dr. Clark has said with a great deal of enthusiasm when it came to us like a new idea that we might save some of those structures which our predecessors were sacrificing. There is an age limit in conservatism, and there must also be considered race and condition. There is the working-woman who insists above all things that she must be well. Speaking of conservatism in a broad general sense, I believe it will depend on the condition of the surrounding structures and on the previous history of the patient. If there is history of long-continued suffering and of invalidism for years, I am more apt to be radical there than to conserve. It depends, too, on the point of view of the patient. I am willing to be conservative if the patient will take the brunt of what will come in the way of relapse. As a matter of fact, I find the patient leaves the decision to me. If the patient says: "I want above all things menstrual function and the chance of conception," then I do everything I can, putting the burden in the way of relapse on the patient.

In regard to the Graafian follicles, unless there is very decidedly clear ovarian tissue, it is a mistake to leave a mere shell of an ovary. Unless the patient insists I would hardly recommend leaving structures which were under suspicion on the opposite side having malignant disease on the other. After removing a dermoid cyst from one side I have split the other ovary and taken out one or two dermoid cysts. I believe we ought always to do that if the opposite ovary is enlarged. What shall we do in pelvic inflammatory disease? In many of these cases an ovary is held down under a web of adhesions and is in bad company. The tube is pouring out its infection and if we take out the tube, with that the disease, and free the ovary from its adhesions, I think we can safely be conservative. But, when the ovary has been bound down under old adhesions, I think it ought to be cleared out. When the ovary is retained my plan is to have it held up from the pelvic floor.

Dr. A. Goldspohn, Chicago: This subject has been a favorite one with me for many years; and if I am not mistaken, I was the first to publish anything about resection of ovaries west of the City of New York. I have often been attacked in my position; sometimes by men who were serious, but oftener by theoretical quibblers. Those who were serious from practical experience I respect, but the others scarcely deserve any notice. Nagel of Berlin once made series of sections of ovaries and declared that these follicle cysts as a rule contain ovules,

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that therefore they are all healthy, and that resection of ovaries is uncalled for. This astonishing declaration aroused numerous other equally qualified men to investigate the subject by even more extensive examination of series sections of such follicle cysts; and they all disagreed with Nagel's declaration, saying that the ovules were not present usually, in a normal condition, and that the pathologic nature of the follicles is established both histologically and clinically. Nagel never appeared in defense of his position.

This subject requires the best of our gynecologic acumen. We gain in judgment by experience, and in my opinion it is the supremest test of an operator's judgment to tell chiefly by palpation what is healthy ovary tissue, or how diseased it is, what may we risk leaving and what we ought to remove. It is not the size of these bodies that determines or indicates their health; it is consistence more than anything else. Furthermore, I am guided in this matter by considering the natural destiny of Graafian follicles, namely, to come to the surface and rupture. Normally they do this before they become enlarged to the size of a hazel or hickory nut, as we often see them. If they do become so enlarged, there is something pathologic which has either prevented their rupture, or has caused their overgrowth or hydropic condition; and whether we need to meddle with them or not, will depend partly on the size of these cysts, and more on the thickness and density of the structures overlying them and interfering with the rupture, which is needed to relieve the painful tension in the organ. Again, there are gnarly cirrhotic parts of ovaries, in which all glandular structures are gone, but nerve endings remain in continuous compression, causing much pain, not merely local, but often referred to other organs in the same part of the body, that need to be removed. Of course, such surgery, and in fact all surgery on these parts, is out of order when the tissues are in a state of acute inflammation. That must have subsided. Then only can we tell what really needs to be removed. And, as the opposite policy is correct, with reference to the appendix, appendicitis in women should be cared for by the gynecologist, because he is most likely to make the important differential diagnosis correctly.

Dr. R. Hall, Cincinnati: I think Dr. Kelly emphasized the real points in saying that it is not conservatism if experience demonstrates that in retaining the ovary the gynecologist does not cure his patients. If one removes an ovary and the ovary on the opposite side has a large cyst, possibly the size of an orange, that ovary should be resected and the patient left a portion of the organ. I have to my credit three or four patients, like the one mentioned here, who have borne children afterward. One patient whom I mentioned once before in this Section was over 40 years of age, the mother of one child. Ten years previously a tumor weighing 30 or 40

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pounds and a cyst larger than a large orange were removed, leaving about half of an apparently healthy ovary. In eighteen or twenty months afterward she bore a child, for which she and her husband were very grateful.

It is a question whether it is conservatism in cases in which a cyst is removed and there are multiple cysts in the other ovary if one leaves that ovary. In a few such cases in which I have left the ovary the patients have returned with the symptoms all exaggerated and a secondary operation must then be done. Papers with carefully recorded cases like Dr. Polak's will throw light on the subject and give us a better working plan. For twenty years I have worked along this line myself, keeping careful record of cases, and have come to the conclusion that conservatism in saving the ovaries has a limited field. I believe, however, that in the class of cases mentioned in the paper, operation may be done after the acute stage has subsided. Frequently one is obliged to remove the ovary and the tube involved in the suppuration, but in the majority of instances one can save the ovary by liberating it and removing the tube, cutting it well away into the uterus. The woman is left with a practically normal ovary. This can be attached to the round ligament in a higher position than normal. While the woman may not bear children she retains the function of menstruation. If there is any conservatism in saving the ovaries it is in this class of cases, and it is rarely that such patients return for removal of the ovary.

Dr. C. C. Frederick, Buffalo: During my operative experience of over twenty years, I have been imbued with the idea of conserving for every woman on whom I operated as much ovarian tissue as possible with the view of maintaining menstrual function and the better degree of general nervous tone which ensues as a result of that conservatism. As Dr. Clark has said, we all know the mental condition of patients with total ablation of the ovaries, especially in young women early in the menstrual life. But the older I grow, and the more work I do, and the more results of conservative surgery on the ovaries I see, the more inclined I am to be more radical, especially in cases in which the disease in the ovary is primary. In cases in which the ovary is infected because it is in bad company with its corresponding tube, and especially in infection of the ovary by extension of the inflammatory process, I think by getting rid of the tube and then treating the ovary, if it be abscessed, by exsecting the abscess and cleaning out the pyogenic membrane and cauterizing with carbolic acid or the electric cautery, one can leave that ovary with tissue that will continue to functionate and it will give no further trouble. But when the ovary is primarily diseased in one part, you can make up your mind that if the diseased process has not already attacked the other part of the ovary it will eventually do so. The more I have seen of results of

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conservative surgery in cases in which the disease is primary, the more inclined I am to take the ovary out *in toto*. I have seen many recurrences in this class of cases. Recently a woman came back to me who had been operated on ten years ago. She had multiple cyst of one ovary and a monocyst of the other. At that time she expected to be married and was anxious that the operation should be conservative. Ovarian tissue about two-thirds the size of an ordinary ovary was left. She was in good condition and menstruating six months after the operation. I never saw her again until last week I was sent for and found her a poor, pale, emaciated being in bed with a great big tumor. I found that she had had recurrence of the ovarian tumor which she had neglected. Carcinomatous degeneration with adhesions had ensued and the case was hopeless. I could not take out the tumor without taking her life on the table.

Dr. P. A. Harris, Paterson, N. J.: The routine practice of removing ovaries with diseased or inflamed tubes is absolutely prejudicial to all interests involved. Of all the cases of pus tubes which come to operation, it is in exceptional instances only that both ovaries are so involved as to require their removal. The Fallopian tube is the natural habitat of certain inflammations. The ovary is also sometimes inflamed, but it is always an unwilling participant in the inflammations which ordinarily affect the tubes. When we consider how decidedly dissimilar are the tube and the ovary, both in structure and function, we have a theoretical argument which should sooner have taught us the fallacy of assuming that the ovary is a willing participant in the inflammations which so commonly involve the Fallopian tubes. I am convinced that in not more than 4 per cent. of all cases in which salpingectomy is required will it be necessary to remove both ovaries. I feel sure that 97 per cent. of all women from whom I have removed pus tubes that menstruation continued, and that the removal of the diseased tubes cured them of such pains as resulted from the tubal infections, and that it has been the rule after the removal of the tubes for the patients to return to their normal menstrual habits. Primary dysmenorrhea or the pain with menstruation which existed before the infection of the tubes has not been cured by removal of the tubes. Only such pains as were added to the primary dysmenorrhea by the inflammation of the tubes have been cured by removal of the tubes.

One per cent. and possibly 2 per cent. of women from whom we exsect diseased tubes may have some further trouble due to infection of a remaining ovary. When abscess develops in the ovary in such case it is very easy to cure it by vaginal section and drainage. I think menstruation should be preserved for every woman from whom we remove diseased tubes. An exception might possibly be made for women who have

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suffered from very painful menstruation from childhood. I wish to say that, in my experience, while the exsection of pus tubes has generally cured the patient of all pains which came to her after she acquired the infection, such operations had little or no effect in affording relief from dysmenorrhea, which occurred and continued from puberty. Such dysmenorrhea is only curable by the removal of the ovaries.

Dr. J. O. Polak, Brooklyn: I think that Dr. Hall received a wrong impression from the paper; I do not condemn the preservation of the ovaries in inflammatory cases, but I condemn resection in the presence of inflammatory conditions. Nor do I operate on these patients during the acute stage by the abdominal route. I make vaginal drainage and wait weeks or months before doing anything further, and in that way I am able to save ovaries. All of us who have done obstetrical work and have followed these postpartum infections know what time will do in Nature's efforts to protect the woman and conserve her organs.

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PROCEEDINGS OF THE SESSION

Tuesday, June 8—Afternoon

The Section met in Casino Hall, Steel Pier, and was called to order by the chairman, Dr. Walter P. Manton of Detroit, at 2:10 p. m. The vice-chairman, Dr. H. G. Wetherill of Denver, took the chair, and the chairman's address, on "Mental Alienation in Women and Abdomino-Pelvic Disease," was delivered by Dr. Manton.

The Chairman announced the following Nominating Committee: Drs. C. S. Bacon, Chicago; J. Wesley Bovée, Washington; W. B. Dorsett, St. Louis; Dr. F. F. Lawrence, Columbus; F. F. Simpson, Pittsburg; to meet at 8:45 a. m., Wednesday, June 9.

Dr. A. E. Benjamin read a paper on "The Operation of Choice for Retrodisplacements of the Uterus." Discussed by Drs. Barrett, Bovée, Boldt, Hall, Marcy, Peterson, Stone, Fry, Cohen of Buffalo, Potter, Shoemaker and Benjamin.

Dr. Fred. H. Albee read a paper on "A Study of the Anatomy and Clinical Importance of the Sacroiliac Joint." Discussed by Drs. Frederick, Peterson, Barrett, M. Cohen of Philadelphia and Winebrake of Scranton.

Drs. William S. Gardner and Emil Novak of Baltimore presented a paper on "The Endometrium and Some of Its Variations," which was read by Dr. Novak. Discussed by Drs. Marcy and Clark.

The paper by Dr. Francis D. Donoghue, Boston, on "Chronic Appendicitis with Chronic Perienteritis and Intestinal Obstruction Due to Infolding of Mucosa," was on motion of Dr. Hall referred to the Committee on Publication, for publication at their discretion, Dr. Donoghue having been present but called home.

Wednesday, June 9—Morning

The Section was called to order at 9:10 a. m. by the chairman.

Dr. J. E. Welch, New York City, read a paper on "The Pathology of Eclampsia and Toxemia of Pregnancy."

Dr. Ross McPherson, New York City, read a paper on "Study of Eclampsia with Results in Two Hundred and Fifty

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Cases, from the Wards of the Lying-in Hospital of New York City."

These two papers were discussed by Drs. Wetherill, Cohen of Buffalo, Lawrence, Frederick, Bacon, Fry, Frederick, Peterson, Welch and McPherson.

Dr. J. Wesley Bovée, Washington, read a paper on "A Method of Complete Nephroureterectomy." No discussion.

Dr. F. F. Simpson, Pittsburg, read a paper on "Some Factors Which Contribute to Low Mortality in Abdominal Surgery." Discussed by Drs. Reed of Cincinnati, Carstens, Boldt, Bacon, Lawrence, Morris, Wetherill, McGlinn, Day, and Simpson.

Dr. John Osborn Polak, Brooklyn, read a paper on "Remote Results of Conservative Surgery of the Ovaries." Discussed by Drs. Clark, Kelly, Goldspohn, Hall, Frederick, Sponsor of Indianapolis, Harris and closed by Dr. Polak.

Wednesday, June 9—Afternoon

The Section was called to order at 2:10 p. m. by the Chairman.

Dr. Henry D. Fry of Washington, D. C., read a paper entitled "An Ovarian Abscess Containing a Lumbricoid Worm Within the Cavity." No discussion.

Dr. Horace G. Wetherill, Denver, read a paper on "The Present Status of Irrigation and Drainage in Obstetric and Gynecologic Operations." Discussed by Drs. Potter, Golden, Ill, Jack and Wetherill.

Dr. Ellice McDonald, New York City, read a paper on "Fibromyoma of the Uterus."

Dr. E. E. Montgomery, Philadelphia, read a paper on "Enucleation of Uterine Myomata; Why and When Preferred."

These two papers were discussed by Drs. Boldt, Massey, Kelly, Chase, Tracy, Ill, Frederick, Lawrence, Montgomery and McDonald.

Dr. H. Grad, New York City, read a paper on "Ovariotomy and Myomectomy Early in Pregnancy with Full-Term Delivery." The paper was discussed by Drs. Kelly, Fry, Benjamin, Carstens and closed by Dr. Grad.

On motion and unanimous consent the rule that papers whose authors were not present when announced should be postponed to the close of the program was withdrawn in regard to the paper of Dr. Howard A. Kelly, Baltimore, which was read at this time, entitled "Curettage for Uterine Hemorrhage." Discussed by Drs. Massey, Boldt, Carstens, Fry, Shoemaker, Gardner, Novak, Grad, Boldt and Kelly.

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THURSDAY, JUNE 10—MORNING

The Section was called to order at 9:15 a. m. by the Chairman.

The Nominating Committee made the following report for officers for the coming year: Chairman, Dr. John G. Clark, Philadelphia; vice-chairman, Dr. C. C. Frederick, Buffalo; secretary, Dr. C. Jeff Miller, New Orleans; delegate, Dr. Horace G. Wetherill, Denver; alternate, Dr. I. S. Stone, Washington, D. C.

Dr. Boldt moved that the Secretary cast an affirmative ballot for the gentlemen nominated, the motion was carried and the gentlemen were declared elected.

Dr. G. Betton Massey, Philadelphia, offered a resolution embodying a petition to the House of Delegates for the creation of a Section on Physical Forces and Allied Agencies in Medicine and Surgery. Dr. Carstens moved the endorsement of the resolution and that it be sent to the House of Delegates. Dr. Hall seconded the motion and it was carried.

Dr. H. J. Boldt, New York City, read a paper on "Cancer of the Uterus Too Far Advanced for Radical Operation."

Dr. Walter B. Chase, Brooklyn, read a paper on "Palliative Treatment of Cancer of the Uterus."

These two papers were discussed by Drs. Massey, Carstens, Frederick, Marcy, McGlinn, Stone, Kelly, Polak, Novak, Wetherill, Cohen of Buffalo, Boldt and Chase.

Dr. W. B Dorsett, St. Louis, offered the following resolution, which was adopted:

Resolved, That a Committee of Three (of whom the delegate to the House of Delegates of this Section be one) be appointed to confer with the Committee on Public Instruction of the House of Delegates, as well as to formulate plans of campaigning against cancer, and that they report the result of their work at the next meeting of this Section.

Drs. H. G. Wetherill, Chairman; John G. Clark and Henry D. Schwartz were subsequently appointed on this committee by the Chairman.

Dr. Howard A. Kelly offered resolutions on the need of a reduction in the tariff on radium, which were referred to the House of Delegates.

Dr. I. S. Stone, Washington, read a paper on "Some Minor Gynecologic Matters Which are Often Overlooked." Discussed by Drs. Morris of New York City, Dunning of Newburg, and Martine of Utica.

Dr. Reuben Peterson, Ann Arbor, Mich., read a paper on "Tetanus Developing Twelve Days After Shortening of the

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Ligaments." Discussion by Drs. Dorsett, Waldo, Hutchins, Sullivan, Boldt, Hutchins, Potter, Frederick and Peterson.

Dr. J. H. Carstens, Detroit, read a paper on "The Final Word on the Stem Pessary for Dysmenorrhea, Amenorrhea, Sterility, etc." Discussed by Drs. Kelly, Jack, Benjamin and Carstens.

THURSDAY, JUNE 10—AFTERNOON

The meeting was called to order at 2:20 p. m. by the Chairman.

Dr. H. S. Crossen, St. Louis, read a paper on "Conditions Simulating Early Tubal Pregnancy."

Dr. L. G. Bowers, Dayton, read a paper on "Extrauterine Pregnancy, with Especial Reference to the Proper Operative Period After Tubal Rupture, with Report of Cases." Discussed by Drs. Barrett, Schuman, McPherson, Polak, Stillwagen, Novak, Benjamin, Schwarz, Waldo, Simpson, Wetherill, Shoemaker, Boyd, Crossen and Bowers.

Dr. George R. White, Savannah, read a paper entitled "Cystocele."

These two papers were discussed by Drs. Grad, Martindale of Camden, Barrett, Stone, Goldspohn and White.

After a vote of thanks to the retiring Chairman, the Section was declared adjourned.

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LIST OF MEMBERS OF THE SECTION ON OBSTETRICS AND DISEASES OF WOMEN.

List of present members of the American Medical Association who have registered in the Section on Obstetrics and Diseases of Women during the last five years. The figure following the name indicates the year in which the member registered (8 indicating 1908, 9 indicating 1909, etc.). Any errors which may have occurred should be brought to the attention of the Secretary of the Section.

Abbe, Truman, Stoneleigh Court, Washington, D. C. 9.
Abbott, A. W., Ludington, Mich. 8.
Abbott, B. T., Ocean City, N. J. 4, 9.
Abbott, E. H., 37 Sherwin Bldg., Elgin, Ill. 8.
Abrams, Edw. T., Dollar Bay, Mich. 9.
Adair, J. H., Owatonna, Minn. 8.
Adams, C. T., 5701 Girard Ave., Philadelphia, Pa. 9.
Adams, W. A., Easton, Kan. 8.
Adelsberger, L., Waterloo, Ill. 8.
Agnew, Fred F., Independence, Iowa, 5.
Alexander, A. F., 579 Union Ave., Paterson, N. J. 7, 9.
Alexander, Clara J., Hotel Bristol, Boston. 6.
Allen, Clarence J., Winchester, Mass. 6.
Allen, B., Nashua, N. H. 6.
Allen, H. C., 11 8th St., New Bedford, Mass. 6.
Allen, M. May, 279 Alexander St., Rochester, N. Y. 6, 9.
Alrutz, L. F., Oregon, Ill. 8.
Altman, J. T., cor Church and Vine Sts., Nashville, Tenn. 4, 5, 6.
Anderson, Alexander L., 467 9th St., Brooklyn, N. Y. 6.
Anderson, H. G., Waterbury, Conn. 9.
Andrews, Frank T., 4589 Oakenwald Ave., Chicago. 4, 5, 6.
Andrews, John, Grant City, Mo. 8.
Andrews, R. R., 524 S. State St., Belvidere, Ill. 8.
Anspach, Brooke M., 119 S. 20th St., Philadelphia: 9.
Arnold, B. A., Freeport, Ill. 8.
Arnold, J. O., 2503 N. 18th St., Philadelphia. 7, 9.
Asdale, Joseph W., Beaver Falls, Pa. 6.
Astley, G. Mason, 5211 W. Girard Ave., Philadelphia. 9.
Austin, A. S., Aberdeen, Wash. 5.
Avery, Amos, Sapulpa, Okla. 4.
Ayer, Silas H., 318 Shawmut Ave., Boston. 9.
Bachelle, C. V., 100 State St., Chicago. 8.
Bacon, Charles S., 2156 Sedgwick St., Chicago. 4, 5, 6, 7, 8, 9.
Baer, B. F., 1819 Chestnut St., Philadelphia. 7.
Baer, J. S., 422 S. 3d St., Camden, N. J. 4, 6, 9.
Bainbridge, Wm. S., 34 Gramercy Park, New York City. 9.
Baird, T. A., 522 Cass Ave., Bay City, Mich. 8.
Baker, C. D., Rohrersville, Md. 6.
Baldwin, L. Grant, 28 Schermerhorn St., Brooklyn. 5.
Ball, W. A., Wanette, Okla. 8.
Bandler, Samuel W., 134 W. 87th St., New York City. 7.
Banks, H. L., Hannibal, Mo. 8.
Banks, Rush, Centralia, Wash. 5.
Baptistella, Leo J., New York City. 9.
Barbour, E. E., 2913 N. Adams St., Peoria, Ill. 8.
Barcus, P. J., Crawfordsville, Ind. 8.
Barnes, C. S., 41 S. 19th St., Philadelphia. 9.
Barnes, Ida C., Topeka, Kan. 5.
Barnes, S. S. P., Massillon, Ohio. 9.
Barrell, Charles S., 425 Beacon St., Boston. 6.
Barrett, C. W., 446 St. James Pl., Chicago. 4, 6, 9.
Bartlett, C. W., N. Bennington, Vt. 4, 6.
Bartley, J. P., Comanche, Okla. 8.
Beahan, A. L., Canandaigua, N. Y. 6.
Bean, J. W., 203 Provident Bldg., Tacoma, Wash. 5.

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Beardsley, C. E., Ottawa, Ohio. 8.
Beattie, T. J., 504 Shukert Bldg., Kansas City, Mo. 5, 6.
Beck, C. E., Portland, Pa. 9.
Becker, J. N., 332 N. 9th St., Reading, Pa. 4, 9.
Beer, Wm. F., 107 S. Main St., Salt Lake City, Utah. 6.
Beers, H. E., Wasco, Ore. 5.
Bellamy, W. W., 17 Bowdoin Ave., Dorchester, Mass. 6.
Belville, Frank, Delaware City, Del. 6.
Benjamin, A. E., 1020 Donaldson Bldg., Minneapolis, Minn. 6, 9.
Bennett, Cleaves, Demaree Bldg., Mattoon, Ill. 8.
Benson, H. W., Oakland, Neb. 8.
Bentley, Edwin, 617 Main St., Little Rock, Ark. 6.
Benton, E. A., Central City, Neb. 5.
Berndt, Daniel Albert, 804 Gay St., Portsmouth, Ohio. 6.
Berwick, J. C., Berwick, La. 8.
Bierhoff, Frederick, 53 E. 58th St., New York City. 7.
Bishop, S. P. Delta, Ohio. 4, 5.
Black, T. F., Providence, R. I. 6.
Black, W. T., Randolph Bldg., Memphis, Tenn. 8.
Blanchard, Francis R., Lakeview, Mich. 9.
Blanchard, O. E., Jersey City, 4, 6.
Blaisdell, Frank, Goffston, N. H. 6.
Bland, Curtis, Greensburg, Ind. 9.
Bland, P. B., 1729 Pine St., Philadelphia. 9.
Blankenhorn, H., Orrville, Ohio. 6.
Blauvelt, G. F., Nyack, N. Y. 6.
Blender, William, Carthage, Ill. 8.
Blinks, E. G., Michigan City, Ind. 8.
Bliss, F. E., Warsaw, N. Y. 6.
Blue, C. L., Tocsin, Ind. 8.
Boardman, Wm. E., 388 Marlborough St., Boston. 6.
Bobb, C. S., Mitchell, S. D. 8.
Boldt, Herman J., 39 E. 61st St., New York City. 6, 7, 8, 9.
Bolster, A. S., Worcester, Mass. 6, 8.
Bond, W. L., Somerville, Mass. 6.
Bonifield, C. W. L., 409 Broadway, Cincinnati. 4, 5, 6, 7, 8.
Boogher, Frank, High and Carr Sts., St. Louis, Mo. 8.
Booher, W. T., Bethany, W. Va. 8.
Boswell, Charles J., Mounds, Ill. 6.
Boutelle, H. C., Danvers, Mass. 6.
Boyce, J. Wesley, 1404 H St., N.W., Washington, D. C. 4, 6, 7, 9.
Bowell, B. C., Laporte, Ind. 8.
Bower, H. L., Greenville, Mich. 8.
Bowers, L. G., 141 W. 4th St., Dayton, Ohio. 8, 9.
Bowman, John W., Lemoyne, Pa. 6.
Boys, C. E., Kalamazoo, Mich. 8.
Boyd, G. M., 1909 Spruce St., Philadelphia. 4, 6, 9.
Boynton, P. S., 230 W. 78th St., New York City. 6.
Bradley, W. J., Cedar Rapids, Ia. 6.
Brandt, A. M., Bismarck, N. Dak. 9.
Brannon, G. D., Crown Point, Ind. 8.
Branson, L. H., Iowa City, Ia. 5, 6, 7, 8.
Braunwarth, Emma L., Muscatine, Iowa. 6.
Bray, C. W., 81 Free St., Portland, Me. 6.
Bremmer, H. A., Ashton, Ill. 6.
Brennen, Thomas J., Little Compton, R. I. 6.
Brewer, M. T, DeSoto, Iowa. 8.
Bridgman, J. C., Pocahontas, Iowa. 8.
Briggs, A. B., Ashaway, R. I. 9.
Briggs, H. W., Wilmington, Del. 6, 7, 9.
Broadrup, G. L., Cumberland, Md. 6. 9.
Bronk, E. F., Amsterdam, N. Y. 9.
Brown, C. E., Rossville, Ill. 8.
Brown, E. M., Tacoma, Wash. 5.
Brown, G. S., Conway, Ark. 8.
Brown, J. Y., Metropolitan Bldg., St. Louis, Mo. 8.
Brown, Percy, 155 Newbury St., Boston. 7.
Browning, C. C., Monrovia, Cal. 8.
Brownwell, F. V., Canajoharie, N. Y. 6.
Bryan, William, West New Brighton, N. Y. 6, 9.
Buchanan, W. A., Hammond, Ind. 8.
Buck, A. W., Fall River, Mass. 4.
Buell, Mary C., Cumberland, Md. 9.
Bulla, M. S., Gas City, Ind. 8.
Bullard, R. T., 259 Ave. 23, Los Angeles, Cal. 5, 9.
Bull, Maud L., Marion, Ohio. 9.
Bullard, M. J., Putnam, Conn. 6.
Bunn, Ralph A., Dayton, Ohio. 9.
Bunting, P. D., Elizabeth, N. J. 9.
Burd, E., Lisbon, Ia. 8.
Burrage, Walter L., 282 Newbury St., Boston. 6.
Burch, L. E., 150 N. Spruce St., Nashville, Tenn. 6, 9.
Butz, R. E., York, Pa. 4, 6.
Byall, H. M., Montpelier, Ohio. 8.
Byford, H. T., 1411 E. 51st St., Chicago, Ill. 8.
Cadwallader, I. H., 919 N. Taylor Ave., St. Louis, 4, 8.
Camerer, J. D., Kinmundy, Ill. 8.
Campbell, F. J., Fargo, N. Dak. 5.
Campbell, H. C., 345 E. State St., Jacksonville, Ill. 8.
Campbell, O. B., 2001 Faraon St., St. Joseph, Mo. 8.
Cannaday, J. E., Charleston, W. Va. 6.

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Cantrell, C. E., Greenville, Texas. 6.
Cargill, C. W., Mason City, Ill. 8.
Carpenter, M. C., Fairfield, Ia. 8.
Carroll, Jane W., 285 Ashland Ave., Buffalo, N. Y. 6.
Carstens, J. H., 620 Woodward Ave., Detroit. 4, 5, 6, 7, 9.
Carter, Helen L., 2 Lombardy St., Newark, N. J. 9.
Carver, R. H., Providence, R. I. 4, 6.
Carvill, Lizzie Maud, Somerville, Mass. 6.
Cartwright, Richard, Salem, Ore. 5.
Castle, H. A., Pocatello, Idaho. 5.
Cates, A. B., 2824 Park Ave., Minneapolis. 5.
Cathcart, R. S., 66 Hasell St., Charleston, S. C. 6, 8.
Chandler, S., 2010 Chestnut St., Philadelphia. 4, 6, 7, 9.
Chard, Marie L., 616 Madison Ave., New York City. 9.
Chase, W. B., 936 St. Mark's Ave., Brooklyn. 7, 9.
Chason, J. D., Bainbridge, Ga. 3.
Chenery, F. L., Wayne, Me. 6.
Chilton, J. C., Hannibal, Mo. 8.
Cholerton, Herbert, Somerville, Mass. 6.
Chrisman, W. D., Bradford, Ill. 8.
Churchill, John Darling, Plymouth, Mass. 6.
Clagett, L. S., Blairsville, Pa. 6.
Clark, E. S., Sumas, Wash. 5.
Clark, John G., 2017 Walnut St., Philadelphia. 4, 6, 9.
Clark, S. M. D., 1435 Harmony St., New Orleans, La. 6, 9.
Clark, Margaret V., Waterloo, Iowa. 5.
Clark O. H., Kalamazoo, Mich. 6.
Cleaves, Margaret A., 616 Madison Ave., New York City. 7.
Cleland, F. A., 134 Bloor St., Toronto, Can. 9.
Cobb, F. A., 1683 Western Ave., Toledo, Ohio. 8.
Coffman, Walter R., Mohawk Bldg., Portland, Ore. 5.
Cohen, B., 497 Niagara St., Buffalo. 8, 9.
Cole, Lewis G., 103 Park Ave., New York City. 7.
Coles, Stricker, 2103 Walnut St., Philadelphia. 4, 9.
Collier, E. L., Roscoe, Pa. 6.
Conard, J. W., Sumner, Mo. 8.
Conaway, W. P., 1723 Pacific Ave., Atlantic City. 4, 9.
Congdon, C. E., 859 Humboldt St., Buffalo. 4, 6.
Conner, A. L., 7056 Main St., Philadelphia. 7.
Cook, H. F., 15 Roseville Ave., Newark, N. J. 8.
Cooper, E. M., Carleton, Mich. 8.
Cooper, J. F., 413 Main St., Peoria, Ill. 8.
Cotter, E. J., 301 Shawmut Ave., Boston, Mass. 9.
Cowle, Fannie W., 356 Central Ave., Hot Springs, Ark. 9.
Cox, Edgar, Kokomo, Ind. 8.
Craig, D. H., 386 Commonwealth Ave., Boston. 4, 5, 6, 7, 8.
Craig, N. S., Jennings, La. 8.
Craighead, C. C., Athens, La. 9.
Crawford, Sarah M., 419 Boylston St., Boston. 6.
Cregar, P. B., Plainfield, N. J. 9.
Crist, O. H., 2009 E. Main St., Danville, Ill. 8.
Crosby, Wm. S., 328 S. 17th St., Philadelphia. 9.
Crossen, H. S., 4477 Delmar Ave., St. Louis, Mo. 9.
Crowell, Samuel, 8 Monadnock St., Dorchester, Mass. 6.
Crowley, J. M., Ellsworth, Minn. 8.
Culbertson, Carey, 2854 Washington Blvd., Chicago. 8.
Cullen, T. S., 3 W. Preston St., Baltimore. 4, 6, 7, 8.
Culley, B. L., Jackson, Miss. 5, 6.
Cunningham, J. W., Stanley, Wis. 8.
Da Costa, John C., 2045 Walnut St., Philadelphia. 4, 9.
Dadman, Eliza J., 483 Beacon St., Boston. 8.
Daly, J. J., Tama, S. D. 8.
Dannaker, C. A., 425 Benton Blvd., Kansas City, Mo. 5.
Darling, Chas. B., 27 Rockville Park, Boston. 6.
Darnall, W. E., 121 S. Illinois St., Atlantic City. 6, 9.
Darroch, S. C., Cayuga, Ind. 8.
Davenport, J. H., 210 Benefit St., Providence, R. I. 6.
Daubenspeck, C. F., 226 N. Main St., Butler, Pa. 8.
Davidson, H. A., 418 Atherton Bldg., Louisville, Ky. 8.
Davidson, H. S., Woods Block, Atherton, O. 8.
Davis, Bessie D., 28 Magazine St., Cambridge, Mass. 6.
Davis, D. W., Wellston, O. 9.
Davis, Edward P., 250 S. 21st St., Philadelphia. 6, 7.
Davis, Effa V., 2314 N. Clark St., Chicago. 5, 6.
Davis, Ella M., Holyoke, Mass. 9.
Davis, E. W., Seymour, Conn. 9.
Davis, Fannie, Oil City, Pa. 9.
Davis, J. C., 19 Cumberland St., Rochester, N. Y. 4, 9.
Davis, J. E., 831 Fort St., W., Detroit. 8.
Davis, John D. S., 2031 G. Ave., Birmingham, Ala. 6, 7.
Davis, R. A., 1006 N. State St., Chicago. 8.
Davis, S. R., Lynn, Mass. 6.
Davenport, Francis H., 419 Boylston St., Boston. 6.
Day, Mary Gage, Kingston-on-Hudson, N. Y. 9.
Deal, John C., 3911 Locust St., Philadelphia. 9.
Dean, W. F., Osceola, Ia. 8.
Dearborn, S. S., Nashua, N. H. 6.
Deaver, John B., 1634 Walnut St., Philadelphia. 7.

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DeLee, J. B., 3632 Prairie Ave., Chicago. 8.
Denning, Edward J., 216 Broadway, So. Boston. 6.
DeVaul, Oscar, 1664 Porstmouth Ave., Portland, Ore. 5.
Dewire, M. V., Sharon, Wis. 8.
Dickes, John T., Portland, Ind. 6.
Dickson, B. V., Covington, Tenn. 8.
Dickson, W. F., 6331 Woodlawn Ave., Chicago. 5, 8.
Dimond, S. B., Albany, Ill. 8.
Dirks, C. B., Kankakee, Ill. 8.
Doane, Harriet M., Fulton, N. Y. 6.
Dodge, Wm. E., 103 State St., St., Chicago. 6.
Doherty, William B., 1520 W. Market St., Louisville, Ky. 7.
Dolley, Gilman C., 610 S. 54th St., Philadelphia. 9.
Donoghue, Francis D., 864 Beacon St., Boston. 5, 6, 7, 9.
Dorland, W. A. N., 126 S. 17th St., Philadelphia. 4, 9.
Dorsett, E. L., 26 Linmar Bldg., St. Louis. 8.
Dorsett, W. B., 5070 Washington Blvd., St. Louis. 4, 5, 6, 7, 8, 9.
Dorsey, F. B., Keokuk, Iowa. 6, 8.
Downs, A. A., Fairfield, Me. 6.
Druskin, Samuel J., 214 E. Broadway, New York City. 9.
Dubell, J. E., Columbus, N. J. 9.
Duckering, F. W., 483 Beacon St., Boston. 6.
Duckett, J. D., 2403 Odin Ave., Houston, Tex. 6.
Dudley, E. C., 100 State St., Chicago. 6.
Duncan, H. A., 2721 W. Lehigh Ave., Philadephia. 9.
Dunkelberg, B. C., Sumner, Ia. 8.
Dunton, O. H., Circleville, O. 8.
Dwyer, John E., 878 Mass. Ave., Cambridge, Mass. 6.
Dye, E. A., Vienna Crossroads, Ohio. 8.
Earnest, John G., Candler Bldg., Atlanta, Ga. 6.
Eastman, Thomas Barker, 708 Indiana Pythian Bldg., Indianapolis. 5, 8.
Edward, J. T., Wilbur, Wash. 8.
Edwards, William, Bowdle, S. D. 8.
Eisenmann, Frank, 222 E. Main St., Louisville, Ky. 8.
Eldred, C. C., Joliet, Ill. 5.
Elsner, Simon L., 83 St. Paul St., Rochester, N. Y. 7.
Engle, Perry, Newton, Iowa. 8.
English, C. H., Ft. Wayne, Ind. 8.
Eskey, F. W., Tuscola, Ill. 8.
Estes, O. B., Astoria, Ore. 5.
Evans, F. W., Coos, N. H. 6.
Evans, George B., 17 S. Wilkinson St., Dayton, Ohio. 6.
Ewer, Edward N., Oakland, Cal. 5.
Fair, Robert P., 394 Marlborough St., Boston. 6.
Farquaharson, H. M., 34 Washington St., Chicago. 8.
Farr, E. L., 3 Highland St., Boston. 6.
Ferbert, J. C., California Club, Los Angeles, Cal. 4, 5.
Ferguson, Belle Cooper, The Dalles, Ore. 5.
Ferguson, Chas. E., 328 Newton Claypool Bldg., Indianapolis. 5.
Ferrin, Carlisle Franklin, New London, Conn. 6.
Fischer, A. F., Hubbell, Mich. 8.
Fisher, John M., 222 S. 15th St., Philadelphia. 6, 7, 9.
Fisher, V. L., Mt. Vernon, O. 8.
Fisher, W. H., 913 Madison St., Toledo, O. 8.
Fitch, W. H., Rockford, Ill. 8.
Fithian, J. W., 608 Broadway, Camden, N. J. 6, 9.
Fitts, Alston, Tuscaloosa, Ala. 7.
Fleming, Arthur Bowles, Tamaqua, Pa. 6, 8.
Flower, W. Z., Gibbon, Minn. 8.
Floyd, J. C. M., 224 N. 5th St., Steubenville, Ohio. 6.
Fluemer, O. C., Mt. Clemens, Mich. 9.
Forrest, G. W. K., 1000 Jackson St., Wilmington, Del. 7.
Formad, Marie K., 927 N. Broad St., Philadelphia, 4, 6, 8.
Forster, Davis, 1115 Union Ave., St. Louis, Mo. 6.
Fort, R. E., 209 N. Vine St., Nashville, Tenn. 6, 9.
Foster, Frank P., 554 W. 114th St., New York City. 9.
Foye, A. Francis, 1118 13th St., Washington, D. C. 9.
Frankenthal, L. E., 4825 Woodlawn Ave., Chicago. 8.
Fraser, J. C., Weymouth, Mass. 6.
Freeburg, H. M., Watertown, S. D. 8.
Frederick, C. C., 64 Richmond Ave., Buffalo, N. Y. 6, 7, 8, 9.
French, Charles L., 271 High St., Clinton, Mass. 6.
Fry, H. D., 1601 Conn. Ave., Washington, D. C. 4, 6, 7, 8, 9.
Fulton, J. A., Astoria, Ore. 5.
Fults, J. C., Waterloo, Ill. 8.
Furniss, H. D., 393 W. End Ave., New York City. 9.
Gageby, L. H., New Castle, Pa. 6, 8.
Gaines, Wm. S., Oakesdale, Wash.
Gallager, Harry, Glenolden Dells, Pa. 9.
Gallant, A. Ernest, 540 Madison Ave., New York City. 5, 6, 7, 8, 9.
Garceau, Edgar, 397 Marlborough St., Boston, 6, 7, 8.
Gardner, Wm. S., 6 W. Preston St., Baltimore, Md. 9.
Garland, W. R., 6 Russell St., Plymouth, N. H. 6.
Gardner, W. S., 6 W. Preston St., Baltimore. 4, 6.
Garnett, R. E., Glasgow, Ky. 8.
Garrabrant, C., 1001 Atlanta Ave., Atlantic City, N. J. 6, 9.

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Garver, Bessie J., Iowa Falls, Ia., 8.
Gaston, Ida E., 2833 Diamond St., Philadelphia. 4, 6.
Gaver, W. E., Mt. Airy, Md. 6.
Gay, H. S., 1087 Boylston St., Boston. 6.
Gellhorn, George, Linmar Bldg., St. Louis. 8.
Gilcreest, J. Edw., Gainesville, Texas. 5.
Gillespie, G. B., Covington, Tenn. 6.
Girvin, John H., 3912 Walnut St., Philadelphia. 4, 9.
Gilliam, D. Todd, 50 N. 4th St., Columbus, Ohio. 7, 8.
Gillmore, Robert T., 427 E. 63d St., Chicago. 5.
Gledhill, Henry R., Jerseyville, Ill. 6.
Glidden, C. H., Little Falls, N. Y. 4, 6.
Gobble, H. W., Greenfield, Ill. 8.
Godfrey, W. L., 2 E. Main St., Battle Creek, Mich., 6, 7, 8.
Goelet, Augustin H., 70th and Broadway, New York City, 4, 6, 7, 8.
Goffe, J. Riddle, 616 Madison Ave., New York City. 4, 5, 6, 7.
Golden, W. W., Elkins, W. Va. 9.
Goldspohn, A., 2118 Cleveland Ave., Chicago. 4, 5, 6, 7.
Goldthwaite, Seth V., 4 Concord St., Boston. 6.
Goodrich, Wm. A., Waterbury, Conn. 9.
Goodwin, E. M., 724 E. 105th St., Cleveland, O. 8.
Gordon, Seth C., 157 High St., Portland, Me. 6, 7.
Goss, E. L., Carrington, N. D. 8.
Grad, Herman, 159 W. 120th St., New York City. 6, 7, 9.
Graham, F. A., 15th and O Sts., Lincoln, Neb. 8.
Grant, W. H., 293 Newbury St., Boston. 6.
Gratton, W. H., Shawneetown, Ill. 8.
Graves, W. P., 395 Beacon St., Boston. 6.
Gray, C. A., Bonham, Texas. 8.
Gray, D. Frank, 142 Broad St., Providence, R. I. 7.
Gray, F. S., Troy, Vt. 6.
Greeley, J. T., Nashua, N. H. 6.
Green, B. F., Hillsdale, Mich. 8.
Green, Charles Montraville, 78 Marlborough St., Boston. 6.
Greene, Mary T., Castile, N. Y. 9.
Greene, Thos. F., 322 Warren St., Boston. 9.
Greer, Bertha A., Lamoni, Iowa.
Griffith, B. B., La Plante Bldg., Vincennes, Ind. 8.
Griggs, Elma C., Ithaca, N. Y. 5.
Grimmer, C. F., Pekin, Ill. 8.
Griscom, Mary W., 253 S. 17th St., Philadelphia. 8.
Grosvenor, W. F., 824 Sheridan Rd., Chicago. 8.
Ground, Wm. E., Superior, Wis. 5.
Gunn, H. F., Galena, Ill. 8.
Guthrie, J. R., 485 Locust St., Dubuque, Iowa. 4, 5.
Guthrie, W. A., Franklin, Ky. 6.
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Hamilton, S. S., Punxsutawney, Pa. 9.
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Hill, Charles, Pine Island, Minn. 8.
Hill, F. R., Chamber of Commerce Bldg., Tacoma, Wash. 5.
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McCullough, G. T., Higgins Block, Missoula, Mont. 5.
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McCune, M. Virginia, Martinsburg, W. Va. 4, 9.
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McPherson, Ross, 37 Madison Ave., New York. 8, 9.
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Matchette, W. H., Hancock, Mich. 5.
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Merritt, Elsie B., Nevada, Iowa. 8.
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Mikkelson, Agnes, 1943 N. Kedzie Ave., Chicago. 8.
Miles, Clarence C., Greenport, N. Y. 9.
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Miller, C. Jeff, 1638 Joseph St., New Orleans. 6, 7, 8, 9.
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